

The Mining Journal

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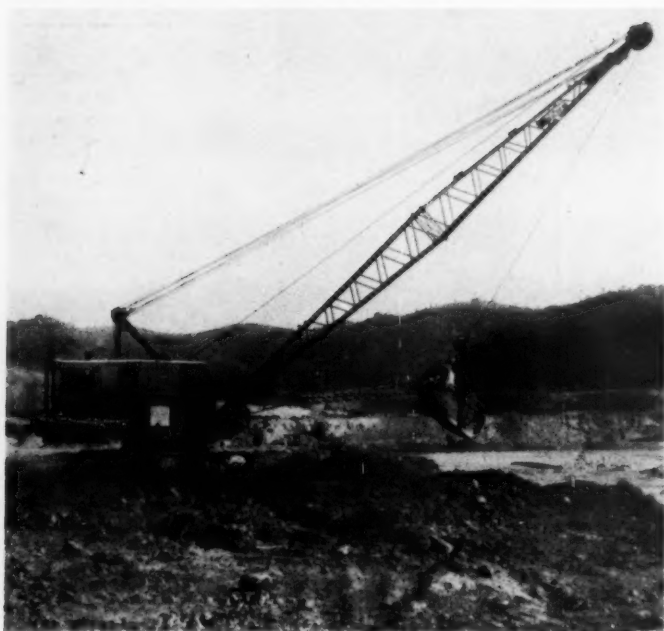
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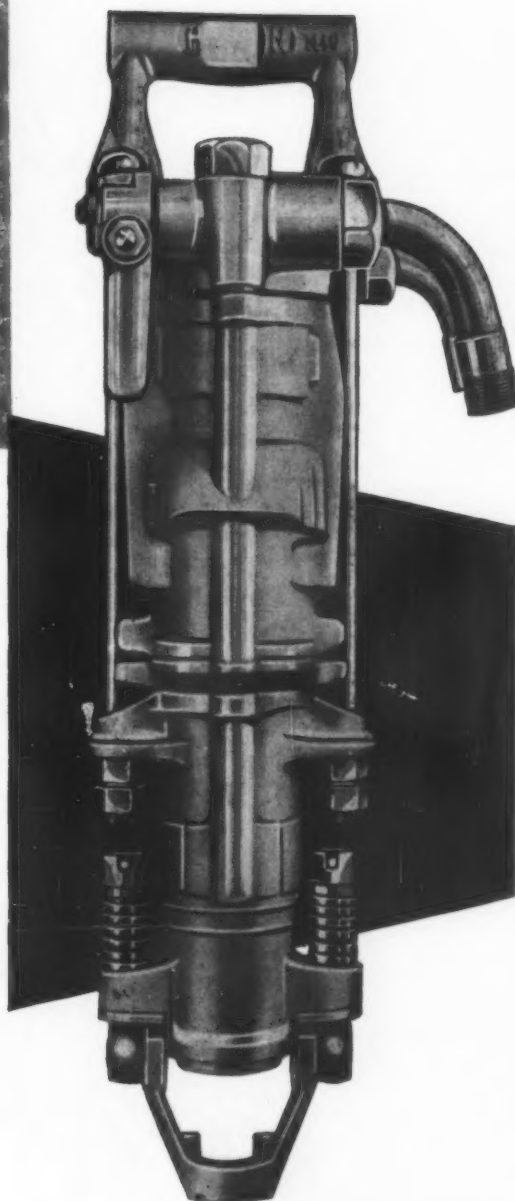
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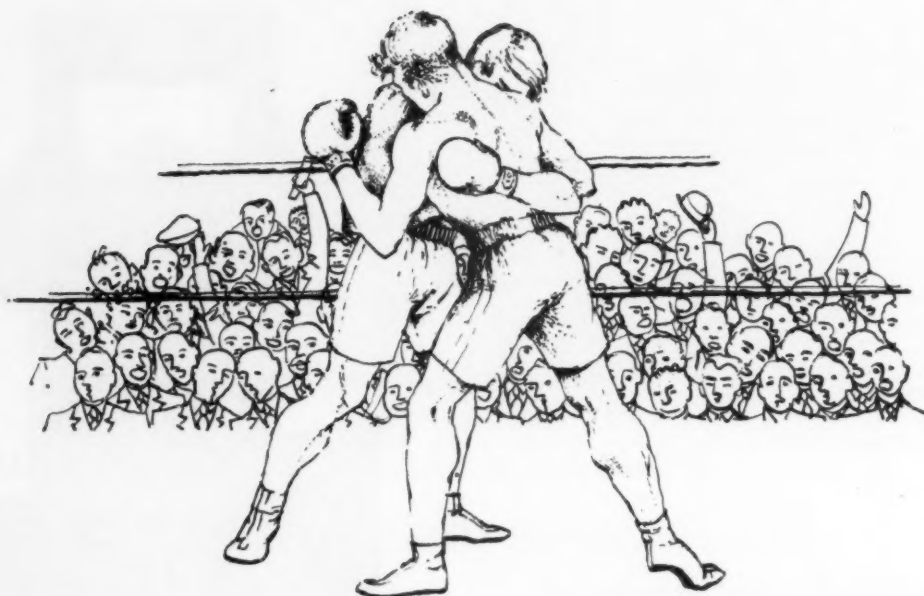
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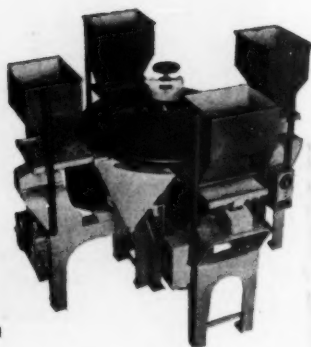


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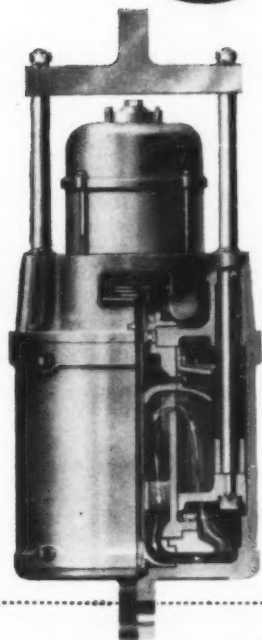
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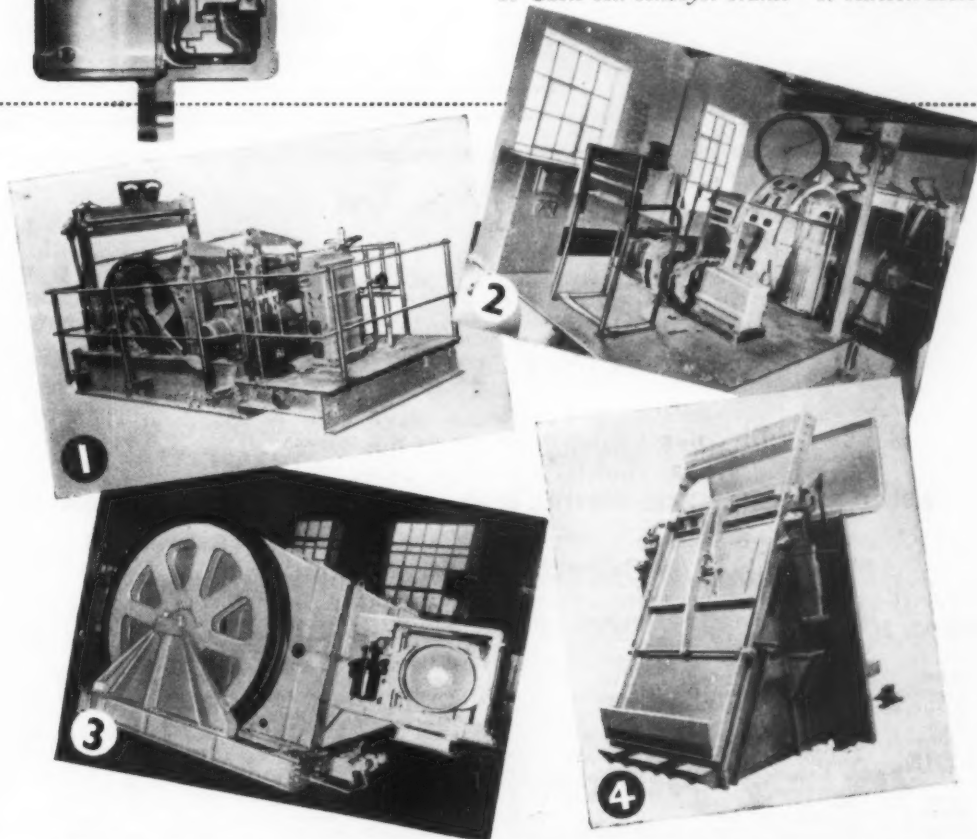
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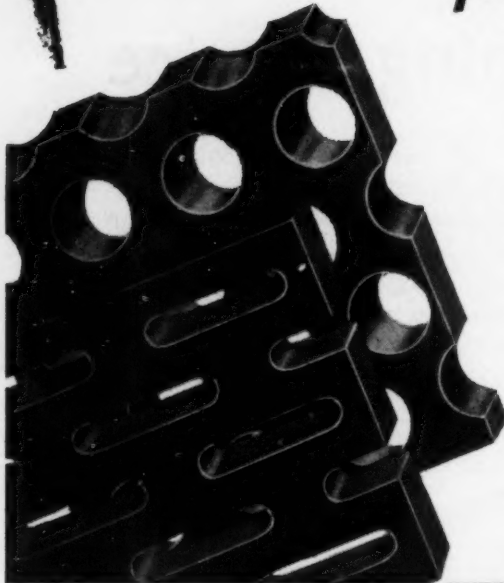


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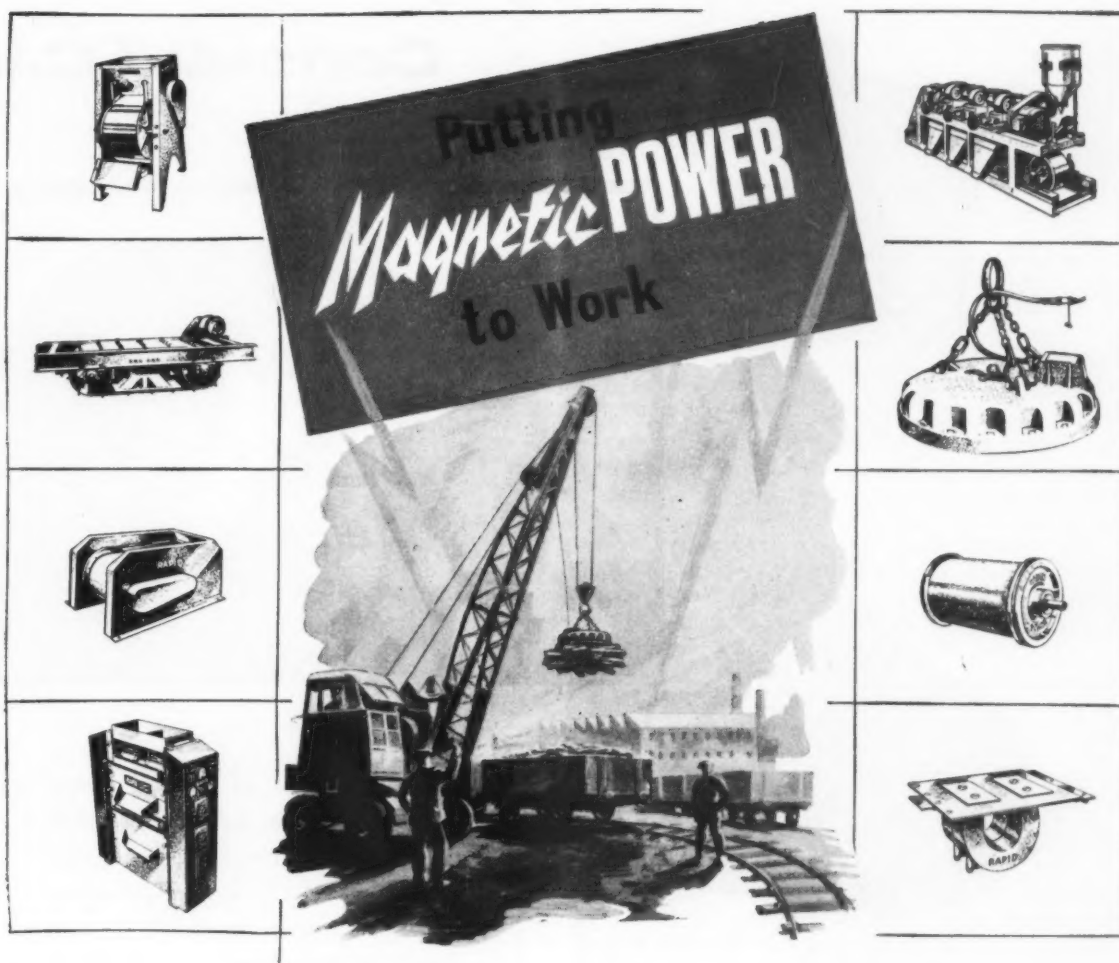
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The Mining Journal

London, July 4, 1958

In this issue . . .

| | |
|---|----|
| Wanted—A Commonsense Approach to Gold | 7 |
| Markets for Chilean Copper | 8 |
| Sicily's Sulphur Problems | 8 |
| Re-assessing Malaya's Tin Lands | 9 |
| Congo Coal | 9 |
| Mechanized Mining at the Rialto Mine, United States | 10 |
| Extraction and Recovery of Some Rarer Metals | 12 |
| British Columbia's Centenary | 14 |
| Mining Miscellany | 15 |
| Technical Briefs | 16 |
| Machinery and Equipment | 17 |
| Metals and Minerals | 18 |
| Mining Finance | 20 |
| Company Meetings and Announcements | 22 |
| London Metal and Ore Prices | 22 |

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Wanted—A Commonsense Approach to Gold

WHEN an irresistible force meets an immovable object, it is liable to resolve this paradoxical situation by undermining the foundations to which the immovable object is attached. Sooner or later this must occur with the price of gold, which cannot remain for ever static in a world of rising commodity prices, if only because the pressure of economic circumstances must eventually become too strong to be resisted.

The arguments for raising the dollar price of gold to a more realistic level are put forward with almost monotonous regularity year after year, and as regularly rejected by those in whose hands the decision finally rests. But the number of economists in favour of a higher gold price appears to be steadily growing and their case becomes progressively more difficult to refute. This year it has been further strengthened by fears of a real depression similar to that of the early 1930's, which might be prevented or remedied by a higher gold price.

Although the pros and cons of this perennial controversy are now well known, the essential points at issue are not always clearly appreciated, even by economists. As Mr. H. C. Koch pointed out in his presidential address to the annual meeting of the Transvaal and Orange Free State Chamber of Mines in Johannesburg, the case for an early and substantial revaluation of gold in terms of all currencies rests on nothing so much as on plain common sense.

The key to the situation is, of course, America. It is by the operation of the Gold Reserve Act passed by the U.S. Congress in January, 1934, that the price at which the Treasury will buy or sell gold is fixed at \$35 an oz. The position has since been further entrenched by a rule of the International Monetary Fund which has the effect of enabling either the U.S. or Britain to veto any proposal to change the par values of the currencies of members.

It is quite surprising, comments Mr. Koch, how strongly some American spokesmen and commentators express their disagreement with any suggestion that the "dollar price of gold" might be raised. Their arguments vary in character from the doctrinaire to the emotional. It seems that, while a general revaluation of gold is widely regarded as inevitable, many Americans still have an irrational fear of it, possibly confusing it with the separate devaluation of the dollar. Their objections include the contention that it would be followed by further inflation; the view that other countries would benefit according to their holdings or production of gold and not upon the selective basis upon which the U.S. has been granting dollar aid; and a reluctance to bring about an enhancement of the value of the gold held and annually produced by Russia.

These objections are roundly demolished by Mr. Koch, who contends that an increase in the dollar price of gold need not have an inflationary effect or one that could not be kept within control. As for the argument for selective aid, he maintains that it takes insufficient account of the added capacity of the U.S. to continue with dollar aid, which would result from the upward valuation of her own enormous stocks of monetary gold.

So far as Russia is concerned, Mr. Koch considers that her stocks of gold are probably not as great as some estimates put them and must at all events be considerably smaller than those of the U.S. Whatever their size, it is a curious argument, as he points out, that the Western World should be denied a simple corrective to its current economic difficulties for fear that the effects would extend to Russia. It becomes even "curiouser", as Alice would say, when it is considered that, as the holder of more than half of the world's gold stock outside Russia, America herself would have the largest windfall from a higher price.

Summing up his arguments in favour of an upward revaluation of world stocks of monetary gold, Mr. Koch claims that it would restore international liquidity to a degree that would give countries in difficulties with their trade balances the necessary breathing space to make appropriate adjustments to their basic economies without resorting to controls and restrictions damaging to their neighbours. Reserves are as important to international trade as adequate working capital is to business. A higher price would also stimulate gold production and so make good to some extent the discrepancy between the rate of expansion of international trade and finance and the rate at which newly mined gold is added to monetary reserves. The fact that gold producers—who have suffered severely in the inflationary cycle—would also receive benefit could certainly not be put forward as a valid objection!

The case for raising the dollar price of gold seems so unanswerable that America's persistent refusal to countenance it must surely rank among the seven wonders of the economic world.

MARKETS FOR CHILEAN COPPER

Within two years Chile's large mines, Chuquicamata and El Salvador (Anaconda), and El Teniente (Kennecott), will be in a position to increase copper production to 520,000 tons from the present average of about 430,000 annually. This will be achieved by investments amounting to \$131,000,000 by both companies, according to a report from the Copper Department to the Ministry of Mines submitted to the Chamber of Deputies.

Two major objectives are:

- (a) To create the necessary conditions for the Chilean copper industry to meet demand of the international market when the latter asks for greater supplies, and
- (b) To reduce production costs of the metal and further improve Chile's competitive position in the world market

The report stresses that in 1957 only 14.4 per cent of export copper was placed in the United States, 82 per cent in Europe and the balance in Latin-American countries and other markets. For 1958 it estimates that production by the large mines will be 438,000 tonnes. Of this, total sales to the U.S. are put at 31,000 tons. But this figure might not be attained because of the loss of production through the recent strike at Chuquicamata.

The report declares that it is now particularly advantageous to assure the sale of Chilean copper in Europe as the U.S. has become a "marginal market", particularly because of protectionist measures for domestic production which could be applied at any moment.

It is claimed that Chile is capable of exporting 30,000 tonnes annually of copper wire. The Soviet Union, China and Czechoslovakia have thus far contracted for purchases of semi-finished copper for a total of 16,300 tonnes, bring-

ing overall export sales by the Chilean manufacturing industry to 31,500 tons, an increase of about 1,000 per cent compared with the exports for 1957.

The Copper Department is to request the government to seek revision of international agreements which prevent Chile from selling her copper freely on the world market. The Council of the Department earlier resolved to support a petition pointing out that political and economic conditions had "changed to such an extent that many raw materials considered strategic some time ago are no longer so considered". The petition also points out that such agreements have proved detrimental to the Chilean national economy.

The Copper Department will ask for representations to be made before the Economic Commission of the United Nations.

SICILY'S SULPHUR PROBLEMS

The crisis under which the Sicilian sulphur industry has been labouring for a number of years—despite various State-sponsored attempts, costly to the taxpayer and useless in the end, at redressing the position—has been responsible for a continuous and serious fall in output. Whereas the index of industrial production in Italy rose from 100 in 1938 to 227 for 1957, the index for sulphur mining fell from 100 to 46.8 per cent during the same lapse of time.

Sulphur, however, is being consumed in ever-increasing quantities by the chemical and other industries and is also of great importance to defence production. These considerations are responsible for the determination of the government to support the Sicilian sulphur industry which, employing some 12,000-13,000 people, accounts for some 93 per cent of Italy's entire sulphur production. Hence a new approach to the problem was made about the middle of 1957, this time within the framework of the expanding economic collaboration between Italy and Western Germany.

Various West German industrial and financial groups have shown a keen interest in Sicily's sulphur industry. Eventually, closer contact was made with one group consisting of Hochtief A.G., of Essen, Vereinigte Untertag-und Schachtbau-Gesellschaft, and Rheinstahl-Industrie Planungs A.G., of Dusseldorf, the group being represented in Italy by Constructa e Sardoplan Società per Azioni. The Italian partner in any joint venture would be Ente Zolfi Italiani, the State-owned Italian Sulphur Board. No agreement has yet been concluded but it appears that the Italo-West German collaboration in this field would cover prospecting for new and more remunerative deposits in Sicily, as well as modernization and rationalization of a number of mines. Other mines whose plants and equipment and exhausted reserves do not justify extra expenditure to bring them to up-to-date condition, would have to be closed down; e.g., some mines in the Enna, Agrigento and Caltanissetta provinces of Central Sicily. "Concentration" is thus the leading idea along with modernization and rationalization of the surviving mines. At the same time, the German partners in the scheme would benefit from the supply of plants and machinery to the Sicilian mines.

Paralleling these endeavours, an agreement has been reached between Ente Zolfi Italiani and the Sicilian Regional Government at Palermo covering the extension of prospecting for new sulphur deposits for another five years. The work is in hand and has been entrusted to Ente Zolfi Italiani.

The hard core of the Sicilian sulphur problem is the

backwardness of the great majority of mines (some, mainly in the provinces referred to above, cling to the old-fashioned methods of treating sulphur rock in kilns) and it is this backwardness which has been primarily responsible for the high cost of the Sicilian sulphur. On the world market Sicilian sulphur would be unsaleable but for the substantial subsidies and other forms of financial assistance it enjoys from the government at Rome and from the Regional Government at Palermo by way of the Banco di Sicilia; an assistance of dubious value since so far it has resulted in an indebtedness of the Sicilian sulphur industry to the tune of Lire 20,000,000,000 (roughly, £11,280,000).

Experts have reached the unanimous opinion that the proposal to close down the unremunerative mines—in a number of which arrears in miners' wages have been fast accumulating in recent months—would be the only way out of the inextricable situation in which the Sicilian sulphur industry finds itself. They propose to keep only those mines in being where the cost of producing one tonne of sulphur is lower than Lire 30,000 (about £16 18s.). To widen the home market for Sicilian sulphur, it is recommended that sulphur should be substituted for the pyrites now being employed in the production of sulphuric acid.

The rayon and staple fibre industry ranks among Italy's most important consumers of sulphur. However, the fact that this industry, which is obliged to use home-produced sulphur, has to pay a higher price for this raw material than its foreign competitors, has proved to be a serious handicap for Italian exports of rayon and staple fibre.

Since the Italian dumping price for export sulphur averages Lire 26,600 per tonne while the home price amounts to Lire 48,600, an Italian industry using sulphur is burdened with the difference of Lire 22,000 per tonne. This resulted in 1956 in additional costs totalling Lire 162,600,000 in the case of cellulose and Lire 545,600,000 in the case of sulphate of carbon. The announcement by the Minister of Foreign Trade that measures designed to alleviate the export position of the textile industry concerned would comprise the removal of restrictions on imports of textile raw materials, and their duty-free entry if intended for the production of export articles, provoked a warning by the sulphur industry that they would close down the mines without delay. No solution of the conflict has yet been reached.

Meanwhile—early in May—Ente Zolfi Italiani reported on a series of measures which have recently been adopted with a view to bringing about an improvement in the Sicilian sulphur industry. These comprise the allocation of Lire 3,000,000,000 (approximately £1,692,000) to be added to the balance of the preceding allocation of Lire 9,000,000,000 earmarked for the reorganization and development of sulphur mining concerns; financing by the State of the purchase and installation of mining equipment and machines (these items had been excluded previously from any measures of relief), and, finally, financing of the purchase, installation and running of a modern sulphur processing plant, firms wishing to benefit from this assistance being required to form a group. On the sales side, a contribution of Lire 10,000 is to be paid for every tonne exported, the quantity involved being limited, however, to the stocks of unsold sulphur as existing on July 15, 1955. Special measures of relief not to exceed in value Lire 1,150,000,000 have been established in respect of those sulphur mines whose costs of production exceed the average limit.

Following upon the discovery of important deposits of high-grade sulphur near Pomezia, some 15 miles from Rome, on the eastern Rome-Naples main railway line, a scheme has been evolved by Società Rumianca, the concessionaire, for the industrial exploitation of the find. These deposits, said to total 10,000,000 tonnes, are situated close to the surface and hence are exploitable. Extending over 1 1/5th

sq. miles they have become the subject of an agreement concluded between Rumianca and the Italian Squibb Co., a subsidiary of Olin Mathieson Chemical Corporation, of New York, for joint exploitation. The agreement also provides for the establishment of a works for the production of triple basic phosphates—some 30,000 tonnes p.a.—as well as of sulphuric acid.

RE-ASSESSING MALAYA'S TIN LANDS

In *The Mining Journal* of June 6, 1958, the urgent need for a more liberal land alienation policy in Malaya was discussed. A recent despatch now brings the information that a Land Administration Commission has given warning that the Malayan tin mining industry must be helped to find and obtain suitable tin-bearing lands to replace worked-out mines.

The three-man commission, comprising Mr. W. L. Payne, President of the Land Court of Queensland, Australia; Mr. C. N. Chandra, a barrister-at-law of India; and Mr. A. P. Mitchell, lately director of Lands and Surveys and Commissioner of Mines in Uganda, Africa, strongly recommended in its report a number of reforms. Among these reforms are the setting-up of a permanent mining committee in each state; improvements in the method of granting and renewing leases; and defraying the cost of rehabilitating mining land from a fund financed by a small cess on all tin exported. The report said that with foresight and prudent administration the leading position Malaya was holding in the world's tin production could be maintained and perhaps improved for many years. Substantial reserves of high-grade tin-bearing ground were believed by the commission to exist both to the west and east of the main range. Comparatively little prospecting had been done in these areas.

Applications for mining should be given priority treatment as far as possible, the report declared. It suggested that State Governments might be induced to support mining if they got a percentage of the export duty from tin extracted in the State.

CONGO COAL

Although in relation to area Africa has very small coal reserves, much is currently being done in order to boost coal output in an endeavour to meet growing industrial needs. This is particularly true of the Congo where most of the output comes from the mineralized areas of Upper Katanga. Despite a tenfold increase in production over the past fifteen years to the present figure of 500,000 tons per annum, it is estimated that at least half as much again is needed. Costs of production are remarkably low and development plans are aimed at maintaining the present high rate of growth of the coal industry.

A Paper issued by the World Power Conference, Belgrade, suggests that it is economically feasible to build a synthetic petrol-from-coal plant in the Luena field, Upper Katanga. Although experience elsewhere suggests that synthetic petrol plants are markedly expensive to install and operate, the long and difficult haul from the coast to Katanga necessarily makes the price of imported fuel oils virtually prohibitive. The government is interested in oil exploration but so far only a limited quantity of oil shale, yielding 150 lb. per ton, has been found.

Mechanized Mining at the Rialto Mine, United States

LITTLE development work is being done in the Picher field, as virtually all ore produced is mined from previously developed ore bodies. All mines in the Picher field were developed from vertical shafts sunk from the surface to one or more mining levels. Virtually all shafts are 5 by 7 ft. or 6 by 6 ft. in cross section. The Rialto mine has 26 shafts, although only five are now equipped for hoisting. Three of these were used for hoisting ore in 1955—shafts 2, 3, and 4. A few shafts were capped with concrete slabs and later covered with mill tailing, but most of them were kept open and used for ventilating, pumping, or servicing the mine with electric cables and air and water lines. Most of the Rialto shafts were sunk originally to depths ranging from about 180 ft. to 240; one shaft (No. 5) was sunk to a maximum depth of 303 ft.

The open-stope method of mining with natural-pillar support has been used in the Rialto mine, as in other mines of the Tri-State district, since operations were begun. Originally, 15 to 25 per cent of the ore was left in the irregularly spaced pillars. Virtually all ore obtained from the mine in recent years has been produced by mining low-grade ore from beds above and below the main ore body and by trimming or completely removing some of the pillars. The percentage of ore that ultimately will be left in the pillars is as yet undetermined.

Method of Drilling

Drilling was done from posts and arms or tripods when American Zinc, Lead and Smelting Co. began operating the mine. The company changed over to jumbo drilling early in 1952. The use of jumbos increased the height of face that could be drilled in one operation from 12 ft. to

Zinc-lead ores have been mined almost continuously from the Rialto tract in Oklahoma since 1916. The property was acquired by American Zinc, Lead and Smelting Co. in late 1951, and the mine was operated by the Nellie B Division of that company until the end of 1955. Mining operations in recent years have been confined largely to trimming and removing pillars and mining low-grade ore that was left in the roof and floor when the main orebody was mined. Mechanization enabled the company to reduce production costs and thereby mine the low-grade ore previously bypassed. The following article, describing mechanized mining operations at the Rialto mine, is condensed from "Information Circular" 7823, published by the U.S. Bureau of Mines.

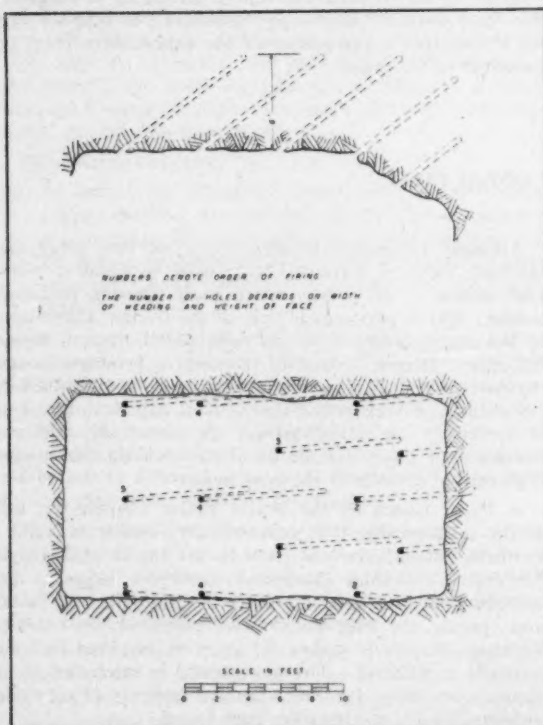
20 or 25 ft. This increased range in drilling height resulted in fewer and larger breaks across the higher faces of ore.

The practice of drilling 18- to 20-ft. splitter and stope holes and chambering them several times before final blasting was replaced by drilling more but shallower holes, 11 to 13 ft in depth, and blasting without chambering. The holes were drilled as a slab round. This method of drilling increased the quantity of ore broken per machine shift from an average of 60 tons to an average minimum of 95 tons and a maximum of 150 tons.

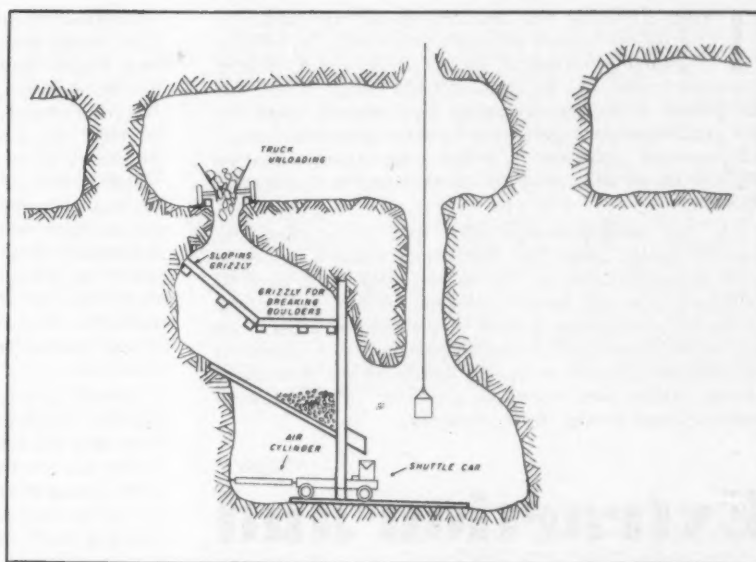
Jumbos were used mainly in "taking up stope," which consisted of mining the ore in beds N, O, and P below the original floor of the mine. The slab-round drill holes in these faces of ore, which ranged up to 20 ft. in height, were spaced so that the burden on each hole did not exceed 6 ft. vertically and horizontally.

The first jumbo to be used was mounted on a D-4 Caterpillar diesel tractor and carried two I-R 505 drifters on 11-ft. chain-drive sashes. The jibs on this jumbo, which were built and mounted in the company shop, were raised and lowered by an air hoist. Soon after this jumbo was put into use (early in 1952) 2½-in. carbide-insert bits were substituted for the 2½-in., detachable steel bits being used. The insert bits, with 2 lengths of steel, 11 and 15 ft., were tried to take full advantage of the long sash and reduce the time lost in changing steel and bits. The results were so encouraging that drilling jumbos were mounted on several diesel trucks. The truck-mounted jumbos were equipped with Joy hydraulic jibs, 8-ft. aluminium sashes, and I-R D-35 drifters.

The source of a substantial part of the ore mined in recent years was the low-grade ore left in the roof during earlier mining. In some areas mineralization was continuous through the G, H, K, and L beds; in others the barren or sparsely mineralized beds directly over the M bed were thin enough to permit profitable mining of all beds through the K or G beds. A special drill tower was built in the company shop for mining this roof ore. The tower, which can be raised to a height of 40 ft., is mounted on a Caterpillar diesel No. 212 motor grader. The unit was stabilized for drilling and scaling by forcing the blade of the grader against the floor. The tower can be telescoped



Alongside, at right, a non-scale drawing of underground hopper layout at No. 2 Shaft, Rialto Mine. On opposite page, below at left, sketch of a jumbo slab round



to 20 ft. and lowered to a horizontal or lower position when being moved about the mine.

Air pressure at the drills was maintained at about 80 p.s.i. All drilling was done with 1- $\frac{1}{4}$ -in. hollow-round low-carbon drill steel.

Blasting and Loading

The explosive used most for blasting in the early days was ammonia dynamite of 33 per cent strength. Gelatin dynamite of 40 per cent strength was used in wet ground and in confined areas where noxious fumes were not readily expelled. The latest practice in the Rialto mine was to use 30 per cent semigelatin dynamite for all blasting. The explosive charges were fired with No. 6 caps and fuse. The quantity of semigelatin dynamite consumed ranged from 0.60 to 0.80 lb. per ton of ore broken.

Loading equipment in the Rialto mine consisted of five Caterpillar HT4 Traxcavator front-end loaders and two 3-drum slusher hoists on crawler-mounted ramps. All ore hoisted in 1955 was loaded by front-end loaders.

Ore was transported underground to the hoisting shafts with diesel-powered standard dump trucks and semitrailer bottom-dump trucks. The standard dump trucks had carrying capacities of about 5 s.tons of ore, and the semitrailer trucks 5.5 tons. The dump trucks were equipped with standard hydraulic lifts and airbrakes. Dump trucks were used for hauling to No. 3 shaft, mainly because they were better suited to handling and dumping the coarse ore broken in that part of the mine. Stopping in the sheet-ground beds N and O and mining the L-bed roof ore there produced many boulders that required further breaking before being loaded into cans for hoisting. The semitrailer trucks were well suited to hauling ore from the areas served by Nos. 2 and 4 shafts. Much of the ore hauled to these shafts was mined from large pillars in the M bed and from the overlying thin-bedded G, H, or K beds. Good fragmentation was obtained, and most of the ore was transported over moderate grades on the main level.

The transfer hopper at No. 2 shaft was built to hold about 200 tons of ore. The grizzly was installed below road level. The dumping slot was designed for unloading ore from the semitrailer trucks but could also accommodate the dump trucks. No grizzly was used at No. 4

shaft; otherwise, the shaft and hopper layout was similar to that of No. 2 shaft. During 1955, the average truck made 28 round trips per shift, hauling about 140 tons of ore a shift. The average distance of each round trip was 2,800 ft., and the longest haul to a hoisting shaft 2,500 ft.

Hoisting

The hoisting methods used at the Rialto mine, although modified in some details, have been virtually standard in the Tri-State district for many years. Ore was hoisted with single-drum, geared hoists, driven by 75- or 112-h.p. electric motors. Each hoist was installed in a derrick, 40 to 60 ft. above the collar of the shaft, in such a position that the hoistman had full view of the bottom of the shaft.

Ore was hoisted in buckets, 33 in. in dia. and 34 in. in depth. The average capacity of a can was about 1,200 lb. of low-grade ore. Shuttle cars were used at the hoisting shafts to move the cans from the loading positions at the transfer hoppers to the hoisting positions in the shafts. The shuttle car was developed by The Eagle-Picher Co., but those used at the Rialto mine were built in the shops of American Zinc, Lead and Smelting Co. and tailored to the layout of each shaft.

The normal rope speed when ore was being hoisted was 1,000 to 1,200 ft. per min.; this was reduced to not over 600 ft. per min. while men were being raised or lowered. The daily unit output of ore from the three shafts was 375 to 425 tons. The hoisting cables were $\frac{3}{4}$ -in., 7 by 18, non-spin, steel-wire ropes, replaced after hoisting 40,000 tons unless daily inspection indicated failure.

The total output of crude ore from the Rialto mine in 1955 was 359,811 s.tons. The mine was worked one shift a day, six days a week, and produced ore at an average rate of 1,157 tons per day. The tenor of the ore, in terms of mill recovery of concentrates from the crude ore, averaged 2.73 per cent for zinc and 0.21 per cent for lead (based on 60 per cent zinc content and 80 per cent lead content of the zinc and lead concentrate, respectively). The combined recovery in 1955 (2.94 per cent) represents a substantial drop in grade of ore from that mined in the early years. In comparison, the average combined recovery of concentrates during the period 1916-22 was about 8 per cent, and the average from the time operations were begun to the end of 1956 was about 5 per cent.

THE extraction and recovery of the rarer metals is probably carried out more extensively, and with a greater profusion of variety in the U.S.A. than in any other country at the present time. Prior to the last war period, American companies held to their credit the fact that visits were permitted to their establishments to examine their processes in working operation, a feature which is rarely allowed to the same extent in Continental countries.

The vast development of select tool steels, corrosion-resistant metals, alloys for the aircraft industry, let alone more recent activities in the nuclear field, etc., have all contributed towards further demands for rare metals, and the desire to stimulate interest in their characteristics. It may be that present-day security measures have somewhat curtailed the freedom of openly displaying the procedures adopted which were formerly available. The industrial benefits gained proved to be prodigious.

Extraction and Recovery of Some

As an example, the original making of jet engines involved the circuitous individual soldering of turbine blades, and thus did not lend itself to mass production methods, whereas by substituting select rare metal alloys and alloy steels, turbine rotors could be forged complete in the one piece. While the product was admittedly not quite so accurate as the hand-made unit, production is carried out in a fraction of the time, and one claim is that this forging completes the rotor in one-tenth of the period formerly occupied. This success was in no small measure due to the co-operation between various rare metal undertakings, and also the wealth of processes to choose from, the results of which have been proved in other scientific and industrial fields. A brief review of some of the systems adopted is here appended.

Molybdenum and Tantalum

Of the various rare metals which at the turn of the century was regarded as scientific curiosities, molybdenum is now widely in demand, and hence improved extraction and refining processes are now employed. The earlier system of directly treating mineral deposits with ammoniacal liquors to draw up the soluble oxide as crude molybdate liquor, although stated to be still in use, is considered to be too slow. The method of roasting and smelting sulphide ores not only provides a larger tonnage in shorter time, but occupies less labour and floor space.

Initially, molybdenite is accurately concentrated, care being taken to see that volatile materials are absent. This treatment brings the concentration from 1-2 per cent up to some 70 per cent. The concentrates are continuously charged into a multi-deck Herreshoff roasting hearth to remove the sulphur, on similar lines to handling other zinc sulphide ores, with the raw material ground, and clotted

accumulations returned for further grinding as required. The roasted mass is placed on trays made of carborundum and placed inside a select form of electric distillation hearth, with the heating elements located above. These trays are stirred as they slowly move inside the cylindrical furnace, the door of which is equipped with a series of chains to protect the attendant from the great heat which is emitted. Temperatures upwards of 1,200 deg. C. are available, and the oxide of molybdenum, which is volatile at these high degrees passes off, leaving less volatile materials behind as residues. Fans are used to draw off the oxide-laden gases first to a cyclone arrangement, and then to a bag-collector in the form of a sky-blue coloured product. As no zinc is present, the residue mainly comprises silica, lime, iron, and other ordinary slag-bearing materials.

In this particular design of hearth, care has to be taken that the select element bars do not become unduly worn, otherwise the voltage could rise, and cases have been cited where this has reached 250 volts. In view of the light flocculent nature of the powder (a large drum only holds 45 lb.) it has to be made denser by wetting and compressing. Part of this recovered oxide is heated with lime

Rarer Metals

to form calcium molybdate for use in steel-making. While the "Thermite" process of reduction is used to a limited extent, the aluminium powder is largely replaced by ferro-silicon for the production of ferro-molybdenum, while it is ultimately ground to powder of pea-size or less. Hydrogen reduction is not considered economical by this concern.

Another undertaking however, prepares all their pure molybdenum by the hydrogen reduction process. Methods of the kind are advantageously placed where other sections of the process provide a source of hydrogen such as electrolytic systems, where this gas not infrequently goes to waste. While this reduction of the oxide can be done by coal-gas, hydrogen gives much more favourable results, but has the disadvantage that even if moisture is removed, it cannot be used over again. Because of the explosion danger, there is no alternative but to burn off this waste gas.

Electrical heating elements are suitably located around this cylindrical horizontally-constructed furnace of some 15 ft. in length, whereby the oxide can be reduced at different temperatures. The raw material is placed in small trays, reduced so far, then moved to a second stage at a higher degree, and so on until complete reduction is attained, starting at some 700 deg. C. and finishing at about 1,200 deg. C. although on occasion higher temperatures have been necessary.

Tantalum belongs to a different category, and cannot be reduced in this simple manner, since when in heated condition it will absorb nearly any gas. Although mainly produced in the U.S.A., the tantalite employed hails from Australia and Tasmania, where the dressed ore contains upwards of 60 per cent tantalic oxide. While the process initially used hailed from Germany, this was taken over to America by Fanstein, where it was further improved.

By C. C. DOWNIE

The associated columbium was given sparse attention until comparatively recently, although some of the ores actually contained more columbium than tantalum. (Today it is widely in demand for special alloy steels and electronic tubes.) The initial opening of the finely pulverized ore with potassium hydroxide, or potassium bisulphate with more complex material, followed by conversion to fluorides does not appear to have been improved.

Formerly this was followed by crystallization and recrystallization to acquire the double fluoride of potassium and tantalum, from which tantalum acid was precipitated, while the columbium separation depended upon differences in solubility, which repeats laboratory practice adapted on the large scale. Today, advantage is taken of the difference in volatilizing temperatures of the chlorides of the two metals, which is followed by fractional crystallization to remove remaining traces. This materially speeds up separation, and ramifications of similar chlorine separations have been developed for a number of other rare metals.

The tantalum, converted to oxide, is reduced under vacuum in the electric furnace. This appears to follow the methods of Heraeus using a vacuum electric hearth, wherein a powerful vacuum provides a literally gas-free atmosphere, so that during reduction of the metal, no gas remains present to be absorbed.

Although the reducing agent at present used is not divulged, it was formerly paraffin wax, which firstly provides a brittle metal, and which is purified by re-melting with fresh oxide in the proper proportions to cause carbon monoxide to be evolved. The product has to be again compressed and re-melted to ensure freedom from gas inclusions. Although normally melting at some 2,850 deg C. this is materially affected by the powerful vacuum, and to cast the metal free from gas, one arrangement is to have the small ingot mould contained within the confines of the hearth chamber.

The metal is fabricated on the same lines as is nickel, and today it is widely utilized for wet metallurgical and chemical processes where extremely severe corrosive influences prevail. It completely resists aqua regia, and other acids in heated condition in all concentrations, with the exception of hydrofluoric and fuming sulphuric acid, and when cold likewise remains inert to most gases. Accordingly, it is utilized for innumerable linings of existing plant, for pumps, valves, agitators, stills, pots, kettles, and general sheathings, besides laboratory equipment.

Unlike other rare metals, it holds no scrap value, and when old plant is dismantled, it does not pay to have it returned for re-melting. While it is generally asserted that tantalum cannot be deposited out of aqueous solutions, an experimental method using the bromide in bromine solution, without water, and covered by an etheral layer under vacuum, showed possibilities of direct electro-deposition.

Columbium

The columbium contained in the same ores is separated from the condensed chloride following volatilization, and purified by fractional crystallization of the fluo or oxy-fluoride salts, but a recent report indicates that other salts (not mentioned) facilitate the final purification of the metal. In its final reduction in the vacuum electric hearth, columbium shows even more remarkable gas absorption properties than does tantalum. As a consequence, all attempts at reducing the oxide to metallic condition directly have been abandoned, and the first step is simply to reduce it with lampblack to deliberately form the carbide, again using the vacuum electric hearth. An aliquot proportion

of oxide is then mixed with the pulverized mass, and again heated as before to provide crude columbium. This in turn is again pulverized and compressed, this time to the form of blocks which are rolled out as bars.

Unlike the previous electric furnace with ingot mould included, a resistor tube holds the bar material in another electric hearth, again using a powerful vacuum. The strength of this vacuum can be gathered from the fact that, not having to use upwards of 1,950 deg. C. to melt the metal, little more than 1,600 deg. C. suffices to convert it to the condition of a porous mass which is literally gas-free. This in turn is subjected to a mechanical working cycle to provide the solid metal ready for the market. Although for long not enjoying any industrial recognition, columbium has already been tried out for chemical equipment and plant, besides its use for certain electronic valves and special steels, etc.

Tungsten

The extraction of tungsten differs somewhat from other so-called rare metals in that a profusion of tungsten-bearing minerals is available, and hence richer material alone is sometimes selected for recovery. Concentrates upwards of 70 per cent tungstic oxide are heated at dull-red heat with about half their weight of soda ash, until the mass becomes converted, i.e. following repeated stirring, to the desired crude sodium tungstate condition. This is tested by chemical analysis, and while basic hearths of the ordinary reverberatory type have been proposed, the work has also been successfully carried out in iron pots. Care is taken to prevent actual fusion, although the temperature comes very near to that point. Any peroxidizing of the mass would allow manganese to be combined as in the laboratory method, and by dint of maintaining temperatures below fusion, this material is converted to the dioxide.

When the reaction is complete, the mass is drawn out with the assistance of rabbles, and digested in water to recover the sodium tungstate solution. The cyanide fusion which is claimed to be faster, does not appear to be persevered with, and evidently is limited to tin-bearing tungsten ores and residues. The extracted solution of some 50 deg. Twaddell is treated with calcium chloride to precipitate calcium tungstate, but this is difficult to filter unless suitable provisions are made. This precipitate would likewise contain numerous impurities but for largely bypassing them by using hand-picked concentrates of wolframite only. As it is, impurities are largely left in the residue, and the tungstic oxide is digested in ammonia, which is removed and re-cycled for further use. The oxide is reduced by conventional methods, and the metallic tungsten supplied to a neighbouring works engaged on making tungsten products. Where perfectly pure tungsten is required for special purposes, advantage is taken of the same method as is used for molybdenum. The tungstic oxide is placed in small trays in a tubular furnace with electric heating elements located at different points along its 15 ft. length. Hydrogen gas is passed in, and except that the temperatures at these points, and the periods of heating differ, the process of reduction is the same. The powdered tungsten so obtained is upwards of 99.5 per cent pure.

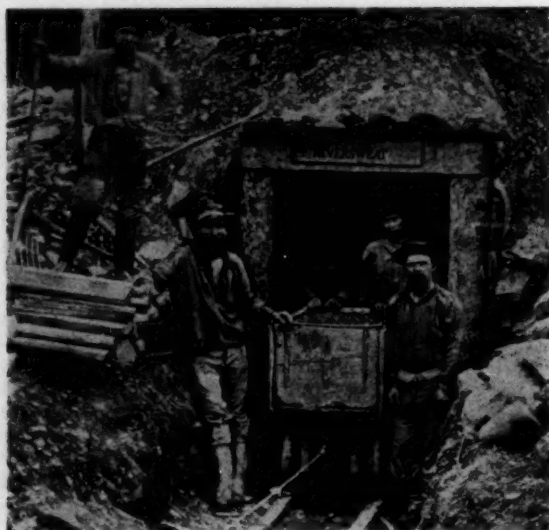
For the direct reduction of ores to ferro-alloys, such as ferro-tungsten, etc., a select type of electric smelting furnace with automatic controls and water jackets has been specially constructed. In the production of ferro-alloys generally, however, a variety of methods and furnaces are taken advantage of, some of which benefit by the near proximity to cheap electric current supplies, and which use heavy bus-bars direct from the source, while others use simply an extensive size of crucible with single electrode.



Modern electric ore train at the Bralorne Mines

BRITISH COLUMBIA'S CENTENARY

The old days. The Neversweat Mine, Williams Creek



ON July 4 a thanksgiving is to be held in Westminster Abbey to mark the 100th anniversary of British Columbia, and on July 12 H.R.H. Princess Margaret goes to the Province as the government's guest.

The first white man to cross the Rockies and reach tide-water was Alexander Mackenzie in 1793. He was followed by Simon Fraser, who in 1808 made the descent of the river now named after him, and by David Thompson, who in 1811 traced the Columbia from source to mouth.

The centenary now being celebrated marks the 100th anniversary of the establishment of a government for the area. That event stemmed from the discovery of gold on the Fraser in the spring of 1858, which attracted widespread interest. At one time there were 20,000 prospectors outfitting at Fort Victoria, turning the post into a city almost overnight. James Douglas, governor of Vancouver Island and chief factor of the Hudson's Bay Co., acted with decision. Although his jurisdiction fell short of the mainland, 80 miles away, he set about issuing mining licences, controlling all navigation on the Fraser, and enforcing the company's trading monopoly, pending instructions from London.

The Colonial Secretary of the day—the once-popular novelist Bulwer Lytton—at once sent out a picked detachment of the Royal Engineers to maintain order; a magistrate in the person of one Matthew Begbie to enforce the law; and to Douglas plenary powers under a special Act of Parliament, establishing the mainland as a Crown Colony. By the terms of his appointment as governor Douglas had to sever his connection with the great company he had served for 37 years.

In 1866, the two colonies of Vancouver Island and British Columbia were united. Five years later, on July 20, 1871, Crown Colony rule ended with the entry of British Columbia into Canada as the Dominion's sixth province.

Today, British Columbia is Canada's third largest and fastest growing province. Within its territory of 366,255 sq. miles—equal to the combined areas of Great Britain, France, Holland, Belgium and Denmark—lies an immense wealth of natural resources in minerals, timber, fish, fruit and water power far outweighing in value those yellow grains in the sandbars of the Fraser which drew men to the country a century ago. Vast hydro-electric enterprises have harnessed the rivers and brought cheap power to the processing of raw materials, even from distant lands, as witness the Kitimat plant 400 miles north of Vancouver, where bauxite from Jamaica is turned into aluminium ingots. Today, B.C.'s immense power resources are being still further augmented by the two 700-mile pipelines snaking across the province to bring oil and natural gas from the newly discovered fields in the Peace River district to the coast.

Writing in the centenary issue of *The Western Miner and Oil Review*, Hartley Sargent, chief of the Mineralogical Branch, British Columbia Department of Mines, points out that, while the early placer mining efforts yielded millions of dollars worth of precious metal, the placer boom made a more lasting contribution in pioneering the opening up of British Columbia. Before the first placer-gold rush, coal had drawn attention to the northern part of Vancouver Island (1836) and to Nanaimo, where production began in 1853, and there had been a brief flurry of lode-gold mining on Moresby Island. Discovery of lode metals and coal in the wake of placer mining and in advance of railway construction still further stimulated development.

By the end of 1900 the accumulated value of mineral production was estimated at more than \$152,000,000, and for that year the value was estimated at more than \$16,000,000. To the end of 1957 the accumulated value of mineral production was almost \$3,900,000,000 and the value for 1957 is estimated at \$165,000,000.

MINING MISCELLANY

Three projects, costing in the vicinity of £130,000, are being undertaken by North Kalgurli (1912) Ltd. Installation of a post-cyanidation section for the Croesus treatment plant is a further demonstration of confidence in the future of the Golden Mile. Previously the Croesus treatment process has comprised flotation of the finely ground ore to produce a pyritic concentrate which is roasted and cyanided for the extraction of gold, the flotation tailings being disposed to dumps. The new installations will enable these tailings to be cyanided before disposal. The plant will include additional agitators, filters, and solution storage, precipitation, and gold-room facilities. Much of this equipment will be new, but some items will be transferred from the Kalgurli ore-treatment plant, of which North Kalgurli was a part-owner until recently. Several units will be taken from the Golden Horseshoe retreatment plant, which ceased operations last year. The company's second project is a shaft-sinking campaign designed to take the shaft to 2,100 ft. A skip-loading station will be installed at 2,050 ft. Finally, the company is constructing new and more convenient administrative buildings close to the main shaft, workshops, and store, which replace the present offices on Kalgurli Hill, built about 1895.

The Congo company, Béceca-Manganese, mined in 1957 some 351,000 tonnes of commercial grade manganese ore, of which 295,000 tonnes were shipped under contract. Stocks at Kisengwa and at the shipment port of Lobito have been increased as a precaution against possible mining or transport hold-ups. The firm's works are being expanded and a new enrichment plant for low-grade ore will start operations in the third quarter of this year. Kisengwa is to be linked with Kolwezi by a high-tension power line, which is to be completed during the second quarter of 1959.

Rising production is reported from the Outokumpu Co.'s Ylivieska mine at Vihanti, Finland. During April this year output reached 1,000,000 tonnes of ore, which compares with 403,000 tonnes in 1957 and 306,000 tonnes in 1956. The ore is said to contain zinc, lead, and copper with reserves for about ten years' working. Test drillings at Reisjärvi and Kaustinen are reported to have given good results.

Broken Hill Associated Smelters Pty. Ltd. will reduce production from its Port Pirie plant by 15 per cent as a contribution towards correcting the excess of world supply over demand for lead. Associated Smelters is co-operatively owned by North Broken Hill, Broken Hill South, and Consolidated Zinc Corporation.

A new diamond swamp has recently been discovered at Ngelchun in Sierra Leone, states a Barclays Bank D.C.O. message from Freetown. On its present showing, it appears to be rich. It is reported that the Diamond Corporation has purchased one stone of industrial diamond weighing 151½ carats at a cost of £4,000.

The governor of the Uganda Develop-

ment Corporation plans to hold London talks in October to raise capital for a £4,000,000 scheme, which envisages mining 2,500,000 tons of ore, producing 400,000 tons of phosphates annually. One of the biggest known phosphate deposits in the world has been under investigation at Tororo, near the Kenya border, by Sukulu Mines Ltd., a company jointly owned by Frobisher Ltd., the Uganda Development Corporation, and Olin Mathieson.

M. Paul Finet, president of the High Authority of the European Coal and Steel Pool, has announced the conclusion of negotiations between the High Authority and a New York syndicate for a private loan of \$50,000,000. It will be used to finance a modernization programme for "little Europe's" coal and steel industries. This will be the third private loan raised abroad by the High Authority.

The manager of the Free State Saaiplaas Gold Mines, Mr. G. A. Merricks, stated recently at a meeting of the S.A. Institute of Mining and Metallurgy that several overseas countries, including Russia, had made inquiries about methods used in shaft-sinking on gold mines in the Union. Inquiries had come from Australia, Britain, Canada, Europe, Russia, and the United States.

Three major mining companies have signed an agreement to develop the Highland Valley iron-copper property of Craigmont Mines Ltd., near Kamloops, British Columbia. These companies—Canadian Exploration Ltd., Noranda Mines Ltd., and Peerless Oil and Gas Inc., of Denver, Colorado—have also agreed to purchase 100,000 Craigmont treasury shares at \$2.40 a share. Under the agreement, the three mining companies will act as operators of any eventual integrated mining and smelting operation at Highland Valley.

As from July 1, African employees of the Sierra Leone Development Co., which mines iron ore in the Port Loko district, will be eligible for an increased gratuity pay. This is because the company's gratuity scheme, which has been in operation since 1955, is to be revised. Under the new scheme, employees will become eligible for thirty days' bonus gratuity on the completion of their tenth, fifteenth, twentieth, and twenty-fifth years of continuous and faithful service. This means that, after twenty-five years' service, a worker would be entitled to a total of 520 days' pay. Employees who have not served long with the company will also benefit; under the new scheme, the five years' minimum of service for gratuity eligibility under the old arrangement is reduced to one year. The company at present employs about 3,750 workers in Sierra Leone.

Canada's Federal Government is to give assistance to the Dominion Coal Corporation to help it maintain normal operations in Nova Scotia. Dominion Coal is a subsidiary of the Dominion Steel and Coal Corporation, which was acquired last year by A. V. Roe (Canada). The company had advised the

government that without aid it would be necessary to extend layoffs, possibly until 9,000 men were out of work. Its difficulties are said to have arisen in part from slow progress in the mechanization programme and from large stocks. It is not thought that the finances of the parent company will be affected.

PERSONAL

At the Transvaal and Orange Free State Chamber of Mines, Mr. P. H. Anderson was elected president for the year now current. Dr. W. J. Busschau and Mr. H. C. Koch were elected vice-presidents.

Dr. Franc. R. Joubin, consulting geologist of Toronto, and Donald H. James of his staff have returned to Canada, having completed a study of the uranium resources of Sweden for Swedish clients. They report that the Swedes are making considerable progress towards producing their own domestic requirements of uranium oxide.

Mr. N. F. H. Railing has resigned from the board of the Mawchi Mines Ltd. Mr. Sydney E. Taylor, of John Taylor and Sons, consulting mining engineers, has been appointed in his place.

Mr. John Edward Denyer has been appointed a director of South Crofty Ltd.

Mr. J. D. Pollett, the Director of Geological Surveys, will represent Sierra Leone at a meeting of all Geological Surveys south of the Sahara to be held this month at Leopoldville, Belgian Congo. The meeting will open on July 14 and end on the 19th. It will be followed by excursions to the lower Congo and visits to places of geological interest. Some of the representatives will visit Franceville, Gaboon, where they will inspect uranium and manganese mines. Mr. Pollett will leave Sierra Leone on July 9 and return on July 27.

Mr. Fred A. Brinker has been appointed assistant vice-president of the Vanadium Corporation of America.

Mr. G. H. N. Todd has been appointed vice-chairman of the board of directors of Burma Mines Ltd.

As from July 1, 1958, Ruston-Bucyrus Ltd. will be represented in south-west England by Mr. F. B. Lawrence and in South Wales by Mr. J. N. Revill.

CONTRACTS AND TENDERS

Formosa

Two tenders for Formosa call respectively for a roller-type grinding mill and a roller mill, both for phosphate rock. The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Lu, Taipei, Taiwan. (Case Nos. GFC-4304 and GFC-4305). Closing dates are July 15 and 16 respectively. B.O.T. Ref. ESB/16661/58 and ESB/16662/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Technical Briefs

Columbite Concentrate from Radioactive Black Sand

An interesting account of the treatment used to separate columbite with euxenite and monazite as separate concentrates from a dredging operation on an alluvial at Bear Valley, United States, is given by S. H. Daylon, in *Mining World*, May, 1958. After making a concentrate at the dredge, the material is transported 20 miles for final treatment. This involves magnetic, high tension, and gravity separation.

The raw concentrate is screened at 0.064 in. and the oversize ground. The pulp is then classified. Some fine quartz is rejected in the overflow and magnetite removed in a Crockett-type separator before being dried. It has been found necessary to scour the sand in Wemco Attritors (essentially Fagergren rotor-stator units) before the separation in order to have clean mineral surfaces.

After drying, further magnetic separation in a drum-type separator removes more magnetite and some ilmenite and the remainder of the ilmenite is separated along with garnet on induced roll separators.

Having removed these fairly strongly magnetic materials, Carpo High Tension Separators remove the columbite-euxenite mixture from the monazite, the latter being a poor conductor. Both the columbite-euxenite product and the monazite-rich material are finally treated after sizing by further magnetic separation and gravity cleaning, using pneumatic tables followed by conventional wet tabling.

By this repeated treatment it is possible to produce good quantity concentrates although the flow sheet is complicated and a number of middling products are returned at various points. Obviously the treatment is difficult, because as in many alluvials, a number of other high specific gravity minerals are present.

OXIDATION OF NICKEL, COBALT AND COPPER

The results of previous work on the oxidation of cobalt had been found to be at variance with theories advanced by Cabrera and Mott for the growth of very thin oxide films.

The investigation reported in a paper by Chessick, Yu and Zettlemoyer, presented at the Second International Congress of Surface Activity, 1957, was therefore designed to study, by gas-adsorption and calorimetric techniques, the oxidation and regeneration of nickel, cobalt and copper powders at oxide-film thicknesses up to 30 Å and at temperatures in the range +26 deg. to -78 deg. C.

It was found that during the first oxidation at each test temperature multiple oxide layers formed in the course of an arbitrarily set time limit of 100 minutes. The bulk of the oxide, particularly in the case of the nickel and cobalt, formed by a fast, non-activated process. This reaction was followed by a slow process, which began abruptly, and in this case the amount of oxygen adsorbed was an exponential function of time.

The oxide surface layers on the nickel and cobalt specimens, and, to a lesser extent, those on copper, could be regenerated for further oxidation by heating in vacuo. Multiple oxide layers formed also on the regenerated samples, but to a lesser degree than during initial oxidation, and the amount of oxygen taken up decreased as the thickness of the oxide film increased. The fast and slow stages of oxygen adsorption were observed also in successive oxidations of the regenerated samples.

The authors propose a mechanism for the regeneration process, based on the formation of metal-lattice vacancies and their elimination by heating. The slow process of oxidation is discussed in terms of relevant work and theories.

NEW SOVIET ZINC PROCESS

The world's first electrolytic cell for the continuous production of zinc has been designed by the Kazakh Chemistry Institute in Alma Ata, Tass, the Soviet news agency, claims.

The conventional method of producing zinc from zinc sulphate solutions in electrolytic cells with stationary cathodes has been replaced by one in which the current density has been increased several times from the usual density of 500 amps. per sq. m. of cathode surface. The stationary cathodes have been replaced by revolving ones so that with the new type of cell zinc is obtained in a continuous ribbon from 0.2 to 0.5 millimetres in thickness.

One of the advantages of the new method is that it is possible to conduct the process in airtight conditions thus removing health hazards, Tass declares, adding that the new method will make it possible to automate zinc production entirely. Tests on an industrial scale are already under way in Kazakhstan and in the Ukraine.

BUBBLY ALUMINIUM

Negotiations are under way for construction of a multi-million dollar plant in Houston, Texas, to produce bubbly aluminium. Officials of Dynamic Metals, Inc., are reported as saying that talks were being carried on with a major aluminium producer to supply molten metal for the process.

Dynamic Metals is the only manufacturing licensee in the United States for a bubbly aluminium developed under a U.S. Air Force contract by Bjorksten Research Laboratories of Wisconsin. The company already has a pilot plant in Houston which is capable of producing up to around 1,000,000 lb. annually of the foam aluminium. Dynamics is licensed to sell bubbly aluminium on world markets. A Peruvian concern is the only other company licensed by Bjorksten to manufacture the product.

Foam aluminium is a new product. This honeycomb-like material will float.

It can be sawed, nailed, screwed, cemented, soldered and brazed at temperatures below its melting point. Filled with bubbles produced by hydrogen gas, the new metal is one-tenth as heavy as aluminium sheet.

HEXMETAL LININGS

Hexmetal cellular reinforcement is now being widely adopted by heavy industry for providing bone in the protective linings and refractories of blast-furnaces, dust collectors, and in sinter and coke bunkers. Hexmetal, made by Causeway Reinforcement Ltd., a member of the Amber Group of Companies, is a fabrication of steel-walled honeycomb cells which, when loaded with cement or refractories, combines to provide a lining resistant to temperature variation, abrasion, vibration, corrosion, and impact load.

Operators of blast-furnaces have installed Hexmetal linings in top cones and in the bends and points of greatest abrasion in the uptakes and at the bends and straight lengths of downcomer pipes. For this work a specially designed mix, produced by Morgan Refractories Ltd., is used.

Hexmetal may also be applied to the lower slopes of bunkers, dust collectors, and the like. The reinforcement is attached to the wall of the bunker by welding and filled with concrete to which quartz or other suitable aggregate is added. Very high abrasion-resistant qualities have been achieved by this method.

Hexmetal is constructed with independent pin joints, the patented features of which were evolved to give flexibility without risk of broken joints under temperature variation or when rolled to very small diameters. The employment of independent pins also makes for resistance to corrosion, since the pins, being unstressed, are less prone to corrosion than integral lugs. Hexmetal is available in carbon steel, stainless iron, aluminized steel strip and also in non-ferrous metals.

COAL IN CANADIAN METALLURGY

The recent suggestion that the development and introduction of non-blast furnace methods for treating iron ore may well provide an important new market for the Canadian coal industry, particularly in those regions where no extensive primary steel production facilities exist at the present time.

Such processes are the Krupp-Renn and several similar processes, using a rotary kiln. Recent processes of this type are the process developed at Domnarvets (Sweden) by Kalling and others, involving using solid fuel and no fuel-fired flame, and the RN process. Several other processes using the fluid-bed principle have also been developed recently which use natural gas or gas manufactured from oil or coal.

Machinery and Equipment

Finer Grinding with Less Contamination

That the efficiency of grinding mills and grinding equipment is generally very low is a widely acknowledged fact amongst ceramic and process engineers. Coupled with the fact that conventional and standard equipment is excessively heavy, control of particle size is difficult and contamination of the charge by the grinding medium is an ever-present problem.

After research, experiment and development, a new patented machine has been perfected which effects fine grinding with close control by high frequency small amplitude vibration. It is the work of two British firms, William Boulton Ltd. and W. Podmore and Sons Ltd.

Realizing the need for more efficient grinding with freedom from contamination, particularly in the sub-micron range, Podmores developed and built a number of small, high frequency mills equipped with electro-magnetic vibrators. It was found, for instance, that minerals having a hardness of 9 on the mohs scale were easily and rapidly ground to give a specific surface of 35,000 cm²/g., the power input being less than one-twentieth that for a ball mill of equal capacity.

As these initial machines were little more than laboratory units, it was necessary to find a way of scaling them up for commercial use, increasing the amplitude of vibration without reducing the frequency. At this stage of the development Wm. Boulton Ltd. had introduced a patented vibratory screen in sizes up to 44 in. dia. using controlled gyratory motion in horizontal planes in which the radial and tangential forces could be altered and adjusted to any load distribution pattern desired. A modified vibrator unit based on this principle was then found to be ideally suitable for the new grinding technique and a joint development programme was initiated, resulting in the production of the Podmore-Boulton Vibro Energy Mill.

The Podmore-Boulton Mill works on the principle of applying small forces at high frequency in conjunction with a special grinding media. With ball milling where excessive force is applied on the grinding media, the media itself is broken up and contamination is high, whereas in the Vibro Energy Mill the forces exerted upon the grinding medium are considerably less, with the result that the medium has a long life and a pure product is obtained. The working volume is at least 95

per cent of the grinding chamber and the space available for grinding is the volume of the interstices between the media. In more than 12 months' continuous use on a mill it has not been found necessary to add to the original quantity of media.

The medium normally used in the Vibro Energy Mill is alorite, a particularly hard abrasion resistant alumina body, cylindrical in shape, chemically inert and resistant to attack by acids and alkalis and sold solely through W. Podmore and Sons Ltd. Due to its great hardness the rate of wear is less and its high density enables wet grinding to be carried out at a much higher slip viscosity, using less water and reducing the drying-out time of the product. The use of alorite ensures non-metallic contamination but the Vibro Energy Mill will work equally well with steel balls if the material is not susceptible to metal contamination. A range of six machines, each in two sizes, is available for both wet and dry grinding. Mills can be arranged for batch or continuous grinding in open or close circuit.

NEW SOUND SYSTEM

In collieries where winding engines for coal haulage, are housed in towers high above ground level, changing the steel winding ropes when they become worn always presents a problem. At Rothes Colliery, Fifeshire, this difficulty has been eased by the installation of a new sound supervisory system developed by Communication Systems Ltd.

The system consists of a number of plug-in points placed at intervals between ground level and the top of the tower. Portable microphone loudspeaker units can be inserted in any of these positions and messages, or instructions, passed throughout the system.

Robust in construction and simple to operate, the portable units are fitted with "call" and "speak" push-buttons. The system has been designed to enable operators to move from point to point as the winding rope is hauled up, and to receive verbal instructions continuously. A message passed from any point is heard in every part of the network, thus enabling all employed in the operation to know what is happening immediately.

A system using a number of fixed type bulkhead units is also being employed at



the Rothes to help speed the flow of coal from the pit, through the preparation plant, and to the awaiting railway wagons.

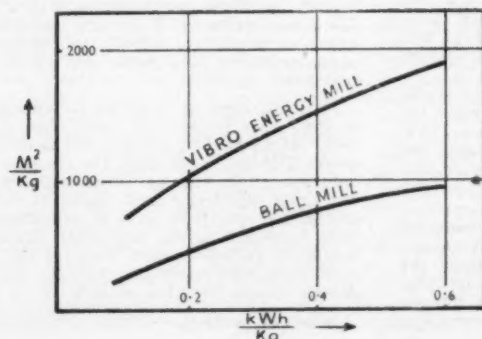
COLOUR AERIAL PHOTOGRAPHY

Contrary to a widely held belief, the direct cost of obtaining colour aerial photography, exposure for exposure, is not significantly greater than the costs promoted in obtaining black and white photographic results. In so far as a mineral exploration programme is concerned, the so-called high cost of colour aerial photography in reality may be rather small. These facts have been brought out recently by R. G. Ray, assistant chief of the photogeology section of the U.S. Geological Survey.

A new experimental film now being tested will eliminate many of the difficulties traditionally associated with these operations. This new colour film has a wider range of latitude in exposure, and results in a Kodacolor-type negative from which black and white as well as colour prints may be made. Filter combinations in the printing process permit colour corrections or distortions which in turn may emphasize certain geological data.

Under optimum weather conditions successful aerial photography may be obtained at altitudes at least as high as 20,000 ft. The resultant exposures may show blue overtones due to scattering of light at the short end of the spectrum as a result of haze conditions. An intermediate altitude of 13,000 ft. to 15,000 ft. may yield the best colour aerial photography. It is significant that some of the colour differences could not be detected on black and white photographs.

It is suggested that the subtle manifestations of colour which would not be revealed on black and white photographs, may well be the greatest contribution the operator can expect from the use of colour aerial photography.



Above, the Vibro Energy Mill Type PB 3, series A. Alongside, at left, graphs showing the grinding rate of quartz on the Vibro Energy Mill compared with a ball mill. $\frac{M^2}{Kg}$ is the specific surface of the product in sq. m. per kg., while $\frac{kWh}{Kg}$ is the corresponding energy required to produce one kg.

Metals and Minerals

Growing Interest In Beryllium

A brightening future was indicated for beryllium at the semi-annual meeting of the American Society of Mechanical Engineers in New York. Mr. Donald R. Walker, of the Avco Manufacturing Corp. of Massachusetts, described work done by his organization to find ways of machining this metal without creating a health hazard. Beryllium's potential usefulness, he stated, stems from its melting point of over 2,300 deg. F. and properties that make it "more realistic than steel" and stronger, pound for pound, than titanium. Possible disadvantages might be its toxicity in some cases, brittleness, and high price as compared with other metals.

The first Symposium on Beryllium Metal was held on June 12 at Reading, Pa., under the sponsorship of the Beryllium Corporation. New research programmes were reported to be under way at the corporation to develop a process for the production of beryllium mill products using conventional billet metal techniques. This new approach, it was stated, could radically reduce the cost of beryllium components. At present, the only method used to produce them is powder metallurgy, a costly process which limits the available sizes and forms.

Interest in beryllium is mounting in the aircraft and missile industry. The metal is also used as a moderator in atomic reactors. Many companies in the nuclear, aircraft, instrument, electronic and electrical manufacturing industries have active development programmes under way, while excellent research support is being provided by the U.S. Air Force and the Navy Department. Nevertheless, much work remains to be done on the metal, particularly in developing manufacturing methods, fabricating techniques, and the establishment of physical and mechanical data for design engineering use.

It was further stated that the Beryllium Corporation had developed methods for hot-pressing beryllium shapes with additives such as boron, for special nuclear applications. A method has also been developed for reclaiming scrap beryllium chips leading to inexpensive re-processing as powder for hot-pressed blanks.

Brush Beryllium Co., of Cleveland, has been awarded a contract for \$1,200,000 of beryllium metal for a large Belgian atomic research reactor, designed by the Nuclear Development Corporation of America.

What is claimed to be the world's smallest precision snap-action electrical switch has been introduced by a U.S. firm. Although measuring only 0.5 x 0.35 x 0.2 in. (on the case) and weighing but 1/28 oz., the switch possesses the remarkable electrical rating of 5 amp. at 250 vac. and 30 vdc. The contacts are of fine silver and the unique snap-action spring is fabricated from beryllium copper.

World production of beryl fell last year to an estimated 11,300 s.tons from

12,900 s.tons in 1956, reports the Bureau of Mines, U.S. Department of the Interior. The largest producers were Brazil (2,165 tons), Mozambique (1,871), Argentina (1,519), Belgian Congo (1,400), India (1,256), Union of South Africa (711), and Southern Rhodesia (572).

United States domestic consumption totalled 521 s.tons, consumption 4,309 tons, and imports 7,290 tons. Beryl imports came from eleven countries, with Brazil, Argentina, India, and Mozambique supplying 81 per cent. The average prices of imported and domestic beryllium were respectively \$357 and \$529 per s.ton.

U.S. MINERALS PROGRAMME

The proposals for America's long-range minerals programme are becoming as varied as the British climate and afford an especially inexhaustible topic of conversation in the metal markets. The position at the time of writing is that the Senate Interior Committee has unanimously approved a programme with new price supports for lead and zinc, but rejected proposals for government stockpiling of these two metals and aluminium. The Bill provides that the government would make up the difference between a market price and levels of 15½ c. a lb. on lead and 13½ c. on zinc. The administration had promised support levels three-quarters of a cent lower on each of these metals.

On Wednesday the Senate Interior Committee voted to lower the maximum amount the government would pay to make up the difference between the market price and the stabilization levels for lead and zinc. It set new maxima of 3.9 c. per lb. on lead and 2.9 c. per lb. on zinc. Previous maxima had been 4 c. for both metals.

The Committee also set a support level on acid-grade fluorspar at \$53 per s.ton instead of the \$48 proposed earlier by the Administration. Moreover, the payment would apply f.o.b. at the point of shipment instead of f.o.b. Rosinclare, Illinois. This provision, aimed at benefiting western producers, would mean, for example, \$18 per ton more to a Colorado producer.

The Administration's proposal for government price supports of \$36 per s.ton unit for tungsten was accepted unchanged. The committee struck out other amendments which would have established price supports on quicksilver, cobalt, antimony, and metallurgical-grade fluorspar.

An administration proposal to stockpile up to 153,000 s.tons of copper for one year at market prices up to a 27½ c. maximum was approved unchanged, but with an addition designed to ensure that such stockpiling would only be for copper mined domestically.

The Bill also includes a financing provision for the five-year price support programme which would eliminate the need for annual appropriations hearings in Congress. It would give the Interior Department \$350,000,000 borrowing

authority to obtain funds directly from the Treasury.

A member of the Senate Interior Committee is reported as stating that when the Bill reaches the Senate floor, an attempt might be made to reinstate lead and zinc stockpiling in the Bill, but he also expressed the view that there might well be a more decided move made in the House to add this provision.

WOLFRAM PRICES FALL

A sharp break in United Kingdom wolfram prices occurred on June 30, dealers suggesting 66s. 6d. to 70s. per 1 ton unit c.i.f. Europe, against 73s. to 75s. previously. Supplies are adequate and demand is described as "very unimpressive".

U.S. INVESTIGATIONS

The U.S. Tariff Commission will start the public hearing in connection with its investigation into the tungsten ore and concentrates industry on July 29. It is also investigating the conditions of competition in the United States between quicksilver produced in the United States and in foreign countries. The public hearing on quicksilver will begin on August 5. Both hearings will take place on the third floor, Tariff Commission Building, 8th and E. Streets, NW., Washington, D.C.

URANIUM EXTRACTION

Deutsche Gold und Silber Scheideanstalt, of Frankfurt, West Germany—Degussa—is reported to have reached an agreement with the Spanish Atomic Energy Board for world-wide exploitation of a Spanish-patented method of uranium extraction. The new process, which is claimed to cut the cost of uranium production by 35 per cent, is understood to involve the use of fluoride and ammonia in place of hydrofluoric acid.

PLATINUM IN 1957

As was to be expected, the report recently issued by the Bureau of Mines, U.S. Department of the Interior, indicates that United States imports and domestic consumption of platinum-group metals dropped sharply in 1957. Total imports of platinum-group metals in all forms were down by 33 per cent (687,073 troy oz. against 1,032,962). Domestic consumption at 745,548 oz. was 13 per cent lower in 1957.

Platinum sales to domestic consumers in 1957 were 19 per cent lower than in 1956. Stocks held by refiners and dealers dropped about 13 per cent. The chemical industry, principally petroleum refining, was again the largest user, taking 70 per cent of the total sold. Sales of palladium were 8 per cent lower. More than three-fourths of palladium sales were for electrical uses, chiefly contacts. Refiners' and dealers' stocks declined moderately.

Sales of iridium, osmium, rhodium,

and ruthenium together were 7 per cent higher in 1957 than in 1956. About 45 per cent of these sales, chiefly rhodium, were for chemical uses, and about 15 per cent for electrical uses. Stocks of the four metals held by refiners and dealers were slightly lower.

The latest report from New York states that leading refiners still adhere to their officially published offering rate of \$67 a troy oz. in bulk and \$70 in smaller quantities, whereas dealers on the "outside market" continue to make fairly substantial offerings as cheaply as \$62 an oz. Demand still shows no evidence of improvement.

EAST GERMAN NICKEL

East Germany's nickel smelter and refinery at St. Egidien, near Hohensteinthal, in the province of Saxonia, is nearing completion. The so-called Renn process will be used by the new plant for the production of ferronickel. The plant will be supplied with ore from a deposit found near Kubschnappel in the Granulitgebirge. The ore is reported to be 30 ft. thick and will be exploited by opencast methods.

NEW ALCOA POTLINES

Alcoa has announced that two new aluminium potlines will go into production at Massena in September or October, when electricity from the New York State Power Authority St. Lawrence project becomes available. They will have an initial combined capacity of 54,000 tons a year. In addition, two idle potlines will be reactivated, providing a further 36,000 tons of aluminium a year.

The Ormet Corporation has started initial alumina production at its Burnside, Louisiana, plant. Full-scale output is scheduled for late summer. Ormet is jointly owned by the Olin Mathieson Chemical Corporation and Revere Copper and Brass.

Sarawak will soon start exporting bauxite from the town of Semantan. The first shipment of 6,000 tons of ore will shortly be dispatched to Formosa. Production from the Semantan deposits is to be raised to 33,000 tons a month.

Billiton is to cut bauxite at Surinam, owing to unfavourable developments in the aluminium industry.

COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

Whilst the undertone of the copper market continues very steady, although with slightly lower values, the same cannot be said of lead and zinc, which have reacted sharply to the most recent developments in the U.S. concerning these two metals.

U.S. COPPER DUTY AGAIN IN FORCE

In spite of what might have been regarded as two "bearish" factors which we shall refer to later, it was noteworthy when dealings opened on Monday how well the market absorbed a substantial selling order from an influential quarter which alone probably accounted for just over half the day's business. At this time, it was known in London that a settlement had been reached in the negotiations between the Braden Copper Co. and the Copper Workers' Union, thereby averting the strike which at one time seemed a near certainty at El Teniente. Official calculations suggest that a wage increase of 27 per cent was agreed.

On July 1 the suspension of the U.S. import duty on copper ended and as from that day a 1.7 c. tariff came into force. This factor, rather than any marked improvement in consumer demand, prompted Phelps Dodge to raise their price 1½ c. to 26½ c. in line with Anaconda and it was expected that Kennecott would waste no time in falling into line. The fabricating subsidiaries of Anaconda continue to sell their products on the basis of a copper price of 25 c. Demand at the 25 c. level for producer copper was understood to be satisfactory although perhaps not so brisk as in recent weeks. Custom smelters have raised their price to 26 c.

The Administration's proposal to stockpile 150,000 tons at market price up to

27½ c. progressed a stage further at the end of last week when it was approved by the Senate Interior Committee. It must be borne in mind that it still requires approval by the full Senate and House of Representatives where it will almost certainly meet with some opposition. Apart from this, some estimates suggest that the U.S. Government is already buying some 10,000 tons of U.S.-produced copper a month against agreements made some years back to boost production.

Domestic consumption by brass and wire mills and foundries showed an increase in May to 88,447 s.tons against 79,613 s.tons in April and fabricators' stocks declined to 441,001 s.tons against 450,442 s.tons. Stocks in U.K. official warehouses at the end of last week showed a decline of 400 tons to 13,757 tons.

TIN AGAIN SUPPORTED

The tin market has again had to be supported by the buffer stock manager in the face of substantial offerings of what is understood to be metal of Russian origin. At a Press Conference, it was disclosed that an initial approach to the Russians inviting them to join the International Tin Council had been made in Geneva in April this year but no reply was forthcoming. The "formal" approach which we referred to last week will be made as soon as possible and, no doubt, before the next Council meeting in London on July 22. Meanwhile, preliminary comment from Japan and Western Germany does not indicate much enthusiasm towards their becoming consumer participants.

The Eastern price declined sharply on July 1, being the commencement of a new quota period and, consequently, particularly heavy sales. Shipments from

Singapore for June totalled 716½ tons against 619½ in May and 1,168 tons in June, 1957, and comparative figures for Penang were 2,355½, 3,390½ and 3,822. Stocks in U.K. official warehouses for the end of last week were unchanged at 19,010 tons. On Thursday morning the Eastern price was equivalent to £754½ per ton c.i.f. Europe.

FURTHER CUTS IN LEAD-ZINC OUTPUT

Lead and zinc values in London have lost almost all their recent gains following the rejection by the Senate Interior Committee of the proposal that the U.S. Government should stockpile these metals and instead approve a support price scheme. The U.S. price for lead was also lowered in the middle of the week by ½ c. on the lead of a customs smelter. Customs smelters do not, of course, stand to get so much out of the present proposal as a producer or as they would have received from a stockpiling programme. Under the latest support price scheme, producers will receive the difference between the market value and 15½ c. in the case of lead and 13½ c. in the case of zinc, with a maximum payment in each case of 4 c. and with a tonnage limit of 350,000 tons and 550,000 tons per annum respectively.

Apart from the ceiling prices and the maximum amount the government will pay, the terms are broadly the same as those suggested in our last report. Here, as in the case of copper, it is not anticipated the plan will meet with any difficulty in the Senate but there might well be strong opposition in the House.

Meanwhile, during the week further measures have been announced to reduce production of both lead and zinc. The B.H.A.S. lead smelter at Port Pirie, Australia, will reduce production 15 per cent and Asarco are reducing zinc output by 500 tons a month, making their total cutback 25 per cent; both as from July 1. Eagle Picher intended to suspend their mining and smelting operations at one of their plants on July 3 for an indefinite period. The American Zinc Corp. of Tennessee was to close down for three weeks as from the end of June.

Demand for both metals has been of a routine nature although in the case of zinc there has been some improvement from U.K. consumers. O.E.E.C. countries produced 70,780 tonnes of refined zinc in May against 71,778 in April and 3.5 per cent lower than in May, 1957.

Closing prices are as follows:

| | June 26 | | July 3 | |
|-----------------|------------|---------|------------|---------|
| | Buyers | Sellers | Buyers | Sellers |
| COPPER | | | | |
| Cash | £199 | £199½ | £193 | £193½ |
| Three months .. | £199½ | £199½ | £194½ | £195 |
| Settlement .. | £199½ | | £193½ | |
| Week's turnover | 9,750 tons | | 9,025 tons | |
| LEAD | | | | |
| Current ½ month | £75 | £75½ | £71½ | £72 |
| Three months .. | £76 | £76½ | £72½ | £72½ |
| Week's turnover | 3,675 tons | | 6,075 tons | |
| TIN | | | | |
| Cash | £730 | £730½ | £730 | £730½ |
| Three months .. | £733 | £734 | £730½ | £731 |
| Settlement .. | £730½ | | £730½ | |
| Week's turnover | 1,220 tons | | 1,455 tons | |
| ZINC | | | | |
| Current ½ month | £65½ | £65½ | £62½ | £62½ |
| Three months .. | £66½ | £66½ | £63 | £63½ |
| Week's turnover | 5,350 tons | | 5,700 tons | |

London Metal and Ore Prices appear on page 22.

Mining Finance

Mr. Beatty Still Hopeful

When Mr. A. Chester Beatty, chairman of Selection Trust, the mining finance company, forecast a year ago at a time of falling base metal prices that the 7s. dividend rate attained in 1956-57 might be maintainable in 1957-58, it was thought to be a fairly bold prophecy. Despite the fact that copper, for instance, subsequently dropped from £220 a ton to as low as £160 last February, Mr. Beatty's hopes were fulfilled, as was detailed here on June 13 when the preliminary results for the year to March 31 were announced.

In the full report for that period now published, Mr. Beatty, much more remarkably than a year ago, is still hopeful that 7s. will again be forthcoming for 1958-59 despite revenue, which is likely to be lower. True, the chairman on this occasion puts more stress on the fact that he is expressing a hope rather than making a forecast, but stockholders will no doubt draw encouragement from his ability even to hope in the present uncertain circumstances surrounding the

outlook for base metals. And it is in these that Selection Trust has its predominance of interest, 60 per cent in fact. Of this 60 per cent, 20 per cent is now in molybdenum and 40 per cent in other base metals.

The stake in molybdenum has come about through the merger at the end of last year of the American Metal and Climax Molybdenum companies, a merger which has halved Selection Trust's percentage stake in the resultant American Metal Climax concern to 12.4 per cent of the equity. Even so, this holding represents about half by value of Selection Trust's total assets. It is thus necessary to keep one's eye firmly fixed across the Atlantic when assessing prospects for Selection Trust, bearing in mind that the demand for molybdenum is closely linked with the United States steel industry. It is also worth recalling that Amco-Climax controls Rhodesian Selection Trust and through it the Mufulira copper mine in Rhodesia, while a substantial stake is also held in Roan Antelope.

Other interests of Selection Trust can be summarized briefly as follows. It has a 14 per cent holding in Tsumeb Corporation, the South-West Africa base-metal producer. This holding is estimated to be worth £4,000,000 despite the fact that the dividend for the year just ended was cut to 17s. 6d. from 42s. 6d. The holding, incidentally, stands in the Selection Trust balance sheet at only £35,639. Diamonds are represented by a 36 per cent stake in Consolidated African Selection Trust, the Ghana and Sierra Leone producer, which is earning steadily. Lithium and beryllium come into the picture with Bikita Minerals (40 per cent), which operates in Southern Rhodesia and from which dividends have still to come. Selection Trust's gold share holdings are relatively small, representing only about 12 per cent of the total assets, but they are none the less welcome in that they consist principally of Vaal Reefs and Western Holdings, from which increasing dividends have been accruing. Finally, Selection Trust has gone into Canadian oil through a holding of Western Decalta Petroleum.

Selection Trust 10s. stock units are quoted at 75s. to yield rather more than 9 per cent on a 7s. dividend basis. A bull point for Mr. Beatty's hope that this is a true basis is the tax position. A saving of some £200,000 is looked for in 1958-59 as a result of the new flat-rate profits tax. This is quite a reasonable sum in relation to the amount of just under £1,400,000 that was available for dividends last year. The 7s. payment requires just over £1,000,000 net. Mr. Beatty also points out that "the large potential liability to tax which existed in respect of any future distributions out of accumulated earnings has now been removed". With net liquid assets of upwards of £2,000,000, this remark could mean that in the proper circumstances the directors might not be averse to over-distributing actual available profits a little.

Taking into account the additional hope that the company's active exploration programme might turn up a winner sooner or later, Selection Trust units in all the circumstances can hardly be classed as other than one of the least risky of base-metal investments and one which could be responsive in price when the outlook for base metal producers begins to brighten once more.

LONDON MARKET HIGHLIGHTS

During the past week, a smart reversal has been seen in the general pattern of the mining market's behaviour. The past week has seen a further setback in base metal shares but what could be an important revival in Kaffirs.

With Base metals coming back with the metal prices and with Industrial shares becoming more hesitant after the F.B.I. review, it was only in the order of things for Kaffirs to come back into the market picture.

This is the broad background. But the Kaffir market has also been cheered by the forthright challenge thrown out to the U.S. about its attitude to the gold price by Mr. H. C. Koch in his presidential speech at the annual meeting of the Transvaal and O.F.S. Chamber of Mines. And to cap all has come a batch of monthly returns from the mines themselves which in respect of operations during June have been altogether better than there had been reason to expect.

Dealers in the Kaffir market being made the way they are, an isolated tonnage or profit record tends to be disregarded and in any case has no general impact. But in June, F.S. Geduld, President Brand and Western Holdings all hit new tonnage and profit records and tonnage records alone were obtained by Loraine, Steyn and Welkom. Other younger mines also have done better than ever.

Over the past week some impressive gains have, in fact, been scored by a number of the producers in the O.F.S. and Western Transvaal fields. West Driefontein, always a quick mover when the spirit is there, have jumped 7s. 6d. to 104s. 4½d. and Hartebeestfontein, despite a slightly lower profit in June, have advanced 2s. 3d. to a new record level of 65s. 3d., the neighbouring Buffels being 1s. 9d. up at 37s. 3d.

In the O.F.S. group, Western Holdings have stolen much of the thunder, steady absorption of the stock having left the shares fully 5s. higher at 101s. 4½d., while a sudden advance of 1s. to 14s. 9d. in Welkom has reflected the appreciation felt with the mine's record crushing last month. St. Helena have reached an eight-year high of 43s. 6d.

Of the Rand holding companies, "Off-sits" have been much to the fore with the closing of the option and conversion rights on June 30. Over the week the shares have advanced 3s. to 66s. Participating in the general movement, Anglo American, 5s. higher at 147s. 6d., have again shown how quickly these shares respond to improved Kaffir market sentiment.

While dealers in Kaffirs have thus been busier and considerably more hopeful, the base metal sections have still been groping their way along in extremes of uncertainty. The fall in metal prices themselves in the case of copper, lead and zinc has generally cast a shadow across the share market. There is still the basic feeling that whatever short-term fluctuations may be seen it will still pay to invest long term in what might be called blue chip base metals. And this has, in fact, meant that these sections of the mining markets have become subdued rather than weak.

However, Chartered have dropped 1s. 9d. to 61s., Rhokana ½ to 26½ and, in the speculative lot, Rhodesia-Katanga 1s. 3d. to 15s. 3d. The last-named movement may be a better guide to immediate sentiment on Coppers than any other.

Lead-Zincs have fared poorly with the news that the U.S. is not to go forward with any stockpiling plans in these metals. Cons. Zinc are 1s. 3d. down at 47s. 3d.

CENTRAL MINING SURPRISE

Another mining finance house, Central Mining and Investment Corporation, has sprung a surprise in its preliminary results for the year to March 31 last. The group profit, as shown in the accompanying table, is substantially higher than in 1956-57, when the accounts covered a longer period, namely fifteen months. This increase is entirely due to a jump from £171,997 to £800,052 in profits from share realizations. Dividends and interest brought in £1,482,496 against £1,560,976. Even in the post-war mining market boom years, the company did not make anywhere near this latest figure out of its share operations. It thus seems

likely that there may be some special reason for the large 1957-58 income from this source. The full report, due later this month, will no doubt provide the explanation. Guesswork at the moment can only point a possible finger at the liquidation during the year of Central Mining Free State Areas, a major operation that involved the distribution of 2,000,000 Harmony shares together with a cash payment.

| | Year to Mar. 31, 1958 | 15 mths. to Mar. 31, 1957 |
|----------------------------------|--------------------------------|------------------------------------|
| | £ | £ |
| Group profit | 2,165,563 | 1,645,397 |
| Taxation* | 1,023,054 | 552,086 |
| Net profit | 1,142,509 | 1,093,311 |
| Pref. and Ord. divs. | 493,063 | 582,187 |
| Cap. increase ex- penses | 22,562 | — |
| Invests & interests† | 400,602 | £2,610 |
| Net increase in rev. reserves | 226,282 | 513,734 |

* Including profits tax distribution charge.

† Provision for diminution in value.

‡ Credit.

There is no surprise about the Central Mining dividend because the 2s. 6d. final declared had been officially foreshadowed when the 1s. 6d. interim was announced at the end of February last. The total of 4s. compares with 4s. 9d. for the previous fifteen months, which would have been proportionately equivalent to 3s. 9d. for a twelve-month period. As may be seen, the tax charge is relatively higher than a year ago, but there may be some saving in this respect in the current period under the new flat rate of profits tax. Central Mining £1 Ordinary shares have been firm lately at 60s. 3d. cum the final dividend. After allowing for this, the yield is 6.8 per cent. The attractions lie in the potentialities of the company's large liquid resources; under the direction of a board that has been strengthened in its international representation.

WESTERN SELECTION TO CUT OUT DEAD WOOD

The market value of Western Selection and Development Co.'s quoted investments standing in the balance sheet at £957,572 was only £581,970 at September 30 last, the annual report reveals. In view of this depreciation of £375,602 no dividend is being paid for the second year in succession, although the profit of £50,171 against £34,628 in 1955-56 is equal to grossed up earnings of just over 11 per cent on the £937,500 capital. The directors, however, propose to remove this handicap to dividend payments by appropriating the whole of the share premium account of £501,728 and utilizing it in writing down investments. Shareholders' approval is being sought at the annual meeting on July 23.

Meanwhile, £179,403 is being put to reserve against unquoted investments of which £115,000 is being transferred from investment reserve and £64,403 is being taken from 1956-57 profits. This has the effect, together with an appropriation of £22,970 for writing down quoted investments, of reducing the carry-forward from £104,603 to £77,401. The main unquoted holding is Mines Development Syndicate (West Africa) which has lead-zinc properties in Eastern Nigeria. The need to reserve against this item is because the low metal prices are making it

very difficult to raise the necessary capital for this venture to proceed to production. Otherwise, Western Selection is chiefly interested in Ghana gold mines and Nigerian tin mines together with a stake in Canadian mining which now amounts to around £400,000, a sum which is stated to be more than covered by the market value of the investments held in that country where Anglo Barrington Mines is the principal operating concern and Cordoba Mines (gold) and Genrico Nickel Mines (copper-nickel) the principal exploratory projects.

If Western Selection can maintain its earnings and come back into the dividend list with a payment of 10 per cent (which was the amount of the last dividend paid on account of 1954-55), then the 5s. stock units are probably a little undervalued at 4s. 6d. in view of the speculative prospects should one or more of the Canadian ventures turn up trumps.

SELLING SHARES TO AMERICA

It has already been revealed that the new Dillon Read investment trust, the American South African Investment Trust, designed to increase American investment interest in South African shares, will, anyway in part, acquire its holdings from the mining finance houses rather than from dealings on the market either in London or Johannesburg. At the recent General Mining meeting in Johannesburg, it was revealed that the new trust had been granted options on "a substantial portfolio of mining and industrial shares". Presuming that these are going to be acquired at or around current market prices General Mining and the other finance companies that will no doubt play their part are likely to obtain some special profits from these deals bearing in mind the written-down prices at which so many of the mining houses' holdings stand in their balance sheets.

STILL GOING STRONG

The reasonings put forward at the Chamber of Mines' meeting in Johannesburg by Mr. Koch, the retiring president, about the need for a higher gold price are commented on elsewhere in this issue. Mr. Koch, naturally, also had some interesting things to say about the South African gold mining industry. Most startling probably was the calculation that the quantity of gold that can be economically recovered from the proved mining areas is now greater than at any time in the industry's 70-year history. This should be read in conjunction with the opinion that production in the newer areas is likely to continue for "some years" to increase at a rate exceeding that of the decline in the output of the older mines. The record achievements of the industry last year are thus by no means its ultimate peak.

Mr. Koch confirms that the round-table conference on the problems of the marginal mines produced proposals that did not include any form of State subsidy or assistance of one mine by another. It merely resulted in suggestions to the government whereby small reductions in mining costs might be brought about by the relief of vulnerable mines from charges imposed by "certain authorities". There is understandably some expectation that the delayed South African Budget, due to be presented on July 16, may throw some fresh light not only on this subject but also on the upshot of the Finance Minister's promised investiga-

tion into whether uranium earnings should, in fact, be taxed so severely as those from gold.

A NOTABLE OCCASION FOR "OFSITS"

June 30 was an historic occasion in the financial history of the Orange Free State Investment Trust, for it was the closing date for the option and conversion rights attaching to the company's major prior charges, the 5 per cent notes and the 4½ per cent bonds.

The notes were convertible into shares at 60s. and by April 24 last all but £556,000 had been converted. By now the vast majority of those outstanding have doubtless been turned into shares.

The 4½ per cent bonds, which were placed in Switzerland, carried two rights, these being firstly, an option to subscribe for 27 ordinary shares of 10s. at 60s. for each bond of 1,000 Swiss francs; secondly, the right to convert the bonds into shares at the rate of 27 fully paid shares plus a cash payment of 12s. 7d. for each 1,000 franc bond.

It is understood that Swiss investors have tended to retain their bonds and take up their share option. Since this involved putting up extra money, it probably accounted for the selling of Ofbits recently reported from Switzerland. With this source of selling out of the way, this Anglo American Corporation holding company with its substantial and widely spread stake in the rapidly expanding gold mines of the O.F.S., should now become increasingly responsive to the firmness of the Kaffir market. Over the week the shares have advanced 3s. to 66s. For 1957 the company paid an interim of 1s. and a final of 2s., but in view of the rising payments from O.F.S. gold producers, an improvement on this year's forthcoming interim can be expected. On a 4s. per annum basis, the yield offered would be 6.06 per cent.

Idris Distributes More Cash.—A further special cash distribution of 6d. per share, payable July 10, 1958, to members registered on June 30 is to be paid by Idris Hydraulic Tin out of the capital profit arising from the sale of the Kranji Section.

Clutha River's Operations.—For the period May 31 to June 27, 1958, the dredge operated by Clutha River Gold Dredging Ltd. worked 524 hours and recovered 588 oz. of gold.

VACANCY FOR INSPECTOR OF MINES AND QUARRIES

Department of Industry and Commerce, Dublin.

SALARY SCALE: £834-£1,349; commencing salary up to £1,091 may be allowed. AGE LIMITS: 25-40 years. Candidates must hold a first-class Certificate of Competency under the Coal Mines Act, 1911, or equivalent, and have not less than two years' satisfactory experience in a responsible capacity requiring regular underground attendance in a coal mine. Application forms and further particulars from the Secretary, Civil Service Commission, 45 Upper O'Connell Street, Dublin. LATEST DATE FOR RECEIVING COMPLETED APPLICATION FORMS: AUGUST 7, 1958.

GENERAL MINING AND FINANCE CORPORATION, LIMITED

(Incorporated in the Union of South Africa)

EXTRACTS FROM THE CHAIRMAN'S ADDRESS TO SHAREHOLDERS

At the Fifty-Eighth Annual General Meeting of Shareholders held at the Corporation's Offices in Johannesburg, on Tuesday, June 24, 1958, Mr. C. S. McLean, deputizing for Sir George Albu, Bart., Chairman, presided, and after paying a warm tribute to the late Sir Ernest Oppenheimer and welcoming his son, Mr. Harry Oppenheimer, as a Director of the Corporation, stated that the outstanding feature of the Accounts for 1957 was the substantial increase in the income derived from Investments to a record total of £1,235,212. The Corporation's net income for the year at £1,374,745 had reflected an improvement of approximately 40% over the corresponding figure for 1956. £250,000 had been transferred to Investment Reserve, and dividends totalling 25% or 5/- per Ordinary share had been resumed. The total amount written off, due to the depreciation of certain investments, was £185,668. The book value of Investments at the year end was £10,910,305, including those not quoted on a Stock Exchange. The Stock Exchange value of the Quoted Securities on December 31, 1957, was £15,719,926. The marked increase in Revenue was the natural result of the steady expansion of the Corporation's interests since 1948 when the value of the portfolio was approximately £8,000,000. Today the Corporation's investments, including Subsidiary Companies, could be conservatively valued at more than £19,000,000, approximately two-thirds of the value of which was in shares in Gold Mining Companies in the Klerksdorp area, the Orange Free State and the Far West Rand, and in Finance Companies of this and other Groups with interests either entirely or very substantially in the Gold Mining Industry in those areas, whilst about one-fifth of the portfolio was in the older mines of the Witwatersrand, including the substantial interest in West Rand Consolidated Mines Limited.

The loan of £1,000,000 from the Anglo American Corporation of South Africa Limited was repaid by September, 1957. Facilities amounting to £2,000,000 still remain available until December 31, 1959.

The Chairman then stated that the development of the larger mines in the Klerksdorp area under the administration of the Corporation had been accelerated, that satisfactory increases in their profits and dividends had been recorded, and that plans were in hand for further expansion of their gold production. He said that the position of West Rand Consolidated Mines Limited, when the contract for the sale of uranium expired, was assured until December 31, 1964. It seemed probable, however, that the Union would participate in future world markets for the sale of uranium, in which event West Rand Consolidated Mines Limited would be well situated to contribute on a profitable basis.

Reference was made to the recent publication in the press on June 23, 1958, regarding the arrangements for the merging of Riebeeck Gold Mining Company Limited with Loraine Gold Mines Limited, which are to be proposed shortly by the Boards of the two Companies for confirmation by the shareholders thereof.

With regard to the Industrial Companies in which the Corporation is in-

terested, satisfactory trading results had been generally recorded, but it appeared that the tendency towards more competitive trading conditions would continue, whilst platinum and base metal mining companies were going through a difficult period.

The Chairman drew attention to the fact that imports for the year had reached a record total of £551,000,000 against exports, excluding gold, of £438,000,000. There had been a decline of some £31,000,000 in the Union's holdings of gold and foreign exchange at the year end. Against this background the value of gold produced for 1957 at £214,000,000 and some £44,000,000 in respect of uranium exports less related loan repayments assumed great importance in the economy of the country.

It was emphasized that the maintenance of gold production at the highest possible level was of the utmost importance to South Africa, from which it followed that the level of working costs was of vital concern not only to the mining industry but to the country as a whole and, therefore, measures likely to increase costs in the Industry should be avoided wherever possible. Wage demands continually arose in different sectors of the economy which were sometimes met by passing on increased costs to others, including the Gold Mining Industry. A recent example of this had been the wage adjustments by the South African Railways and Harbours, which had been fol-

lowed immediately by an increase in freight rates, an important factor in mining costs.

Turning to the future, the Chairman stated that he believed there would be great opportunities for profitable investment in mining and industry in the years ahead. It was essential, however, that adequate supplies of risk capital should be forthcoming, both from internal and external sources. He shared recently expressed opinions that a greater proportion of internal savings should be directed into mining and industry in the form of equity capital, but did not subscribe to the apprehensive views recently expressed in South Africa regarding the extent of foreign capital invested in our mines and industries. He went on to point out that the Union should continue its endeavours to attract a large amount of capital from overseas if it was to maintain its normal rate of development. The system of management and control of the Gold Mining Industry centred in Johannesburg had been developed over the years to a standard of efficiency certainly equal to that found in comparable large industrial enterprises elsewhere in the world. This was one of the factors which had helped to attract, and in his opinion would continue to attract, overseas capital seeking opportunities for secure and profitable investments.

The Chairman then announced that the Corporation had recently made available to the American South African Investment Trust Limited by way of options, a substantial portfolio of mining and industrial shares and said that the Directors considered that it should participate in the provision of suitable securities for this Trust which was expected to extend American interest in the Union as a field for investment.

LONDON METAL AND ORE PRICES, JULY 3, 1958

METAL PRICES

| | |
|---|--|
| Aluminium, 99.5%, £180 per ton | Iridium, £22 oz. nom. |
| Antimony— | Lanthanum (98/99%) 15s. per gram. |
| English (99%) delivered, 10 cwt. and over £190 per ton | Manganese Metal (98% - 98%) £310 |
| Crude (70%) £190 per ton | Magnesium, 2s. 3½d. lb. |
| Ore (60%) bases 19s. 6d./20s. 6d. nom. per unit, c.i.f. | Nickel, 99.5% (home trade) £600 per ton |
| Arsenic, £400 per ton | Osmium, £18 oz. nom. |
| Bismuth (min. 1 ton lots) 16s. lb. nom. | Osmiridium, nom. |
| Cadmium 10s. 0d. lb. | Palladium, £6 5s./£6 15s. |
| Cerium (99% net), £16 0s. lb. delivered U.K. | Platinum U.K. and Empire Refined £24/£25 oz. |
| Chromium, Cr. 99% 7s. 2d. lb. | Imported £20 10s./£21 10s. |
| Cobalt, 16s. lb. | Quicksilver, £76 10s. ex-warehouse nom. |
| Germanium, 99.99%, Ge. kilo lots 2s. 8d. per gram | Rhodium, £40/£42 oz. |
| Gold, 250s. 4d. | Ruthenium, £14/£16 oz. nom. |
| | Selenium, 50s. 0d. per lb. |
| | Silver, 75d. f. oz. spot and 74½d. f'd. |
| | Tellurium, 14s./15s. lb. |

ORES AND OXIDES

| | |
|---|---|
| Bismuth | 65% 8s. 6d. lb. c.i.f. |
| Chrome Ore— (Fe ratio 3 : 1) | 18/20% 1s. 3d. lb. c.i.f. |
| Rhodesian Metallurgical (semifriable) 48% | £16 5s. 0d. per ton c.i.f. |
| " Hard Lumpy 45% | £16 0s. 0d. per ton c.i.f. |
| " Refractory 40% | £11 10s. 0d. per ton c.i.f. |
| " Smalls 44% | £14 10s. 0d. per ton c.i.f. |
| Baluchistan 48% | £11 15s. 0d. per ton f.o.b. |
| Columbite, 65% combined oxides, high grade | nom. |
| Fluorspar— | |
| Acid Grade, Flotated Material | £22 13s. 3d. per ton ex. works |
| Metallurgical (75/80% CaF ₂) | 156s. 0d. ex works |
| Lithium Ore— | |
| Petatite min. 31% Li ₂ O | 47s. 6d./52s. 6d. per unit f.o.b. Beira |
| Lepidolite min. 31% Li ₂ O | 47s. 6d./52s. 6d. per unit f.o.b. Beira |
| Amblygonite basis 7% Li ₂ O | £26 5s. per ton f.o.b. Beira |
| Magnetite, ground calcined | £28 0s./£30 0s. d/d |
| Magnetite Raw (ground) | £21 0s./£22 0s. d/d |
| Manganese Ore Indian— | |
| Europe (46% - 48%) basis 67s. 6d. freight | nom. |
| Manganese Ore (43% - 45%) | nom. |
| Manganese Ore (38% - 40%) | nom. |
| Molybdenite (85% basis) | 8s. 5d. per lb. (f.o.b.) |
| Titanium Ore— | |
| Rutile 95/97% TiO ₂ (prompt delivery) | £35/£36 per ton c.i.f. Aust'n. |
| Ilmenite 52/54% TiO ₂ | £11 10s. per ton c.i.f. Malayan |
| Wolfram and Scheelite (65%) | 66s. 6d./70s. 0d. per unit c.i.f. |
| Vanadium— | |
| Fused oxide 90 - 95% V ₂ O ₅ | £10 per unit c.i.f. |
| Zircon Sand (Australian) (65 - 66% ZrO ₂) | £14 5s. per ton c.i.f. |

GENERAL EXPLORATION ORANGE FREE STATE, LIMITED

(Incorporated in the Union of South Africa)

EXTRACTS FROM THE CHAIRMAN'S ADDRESS TO STOCKHOLDERS

At the Twelfth Annual General Meeting of Stockholders held on June 24, 1958, the Chairman in dealing with the Accounts for the year ended December 31, 1957, stated that the debit balance on Income and Expenditure Account had been reduced to £18,820. Mainly as a result of the expropriation of both surface and mineral rights of the Remaining Extent of the Farm Vaalbank No. 190, the disposal of the surface only of Sub-Division 1 of the Farm, and the sale of minor investments, profits had been realized which had been transferred to the General Reserve, thereby increasing that account by £31,627. As at December 31, 1957, the Company's cash position had reflected a balance of £781,539 of which £600,000 had been placed on Fixed Deposit.

Dealing with the activities of the Riebeeck Gold Mining Company Limited the Chairman reminded Stockholders that the twin haulage, driven by Loraine Gold Mines Limited on the 48th level from its No. 2 shaft in the direction of borehole K.1 on the Farm Kromdraai 586, had intersected a reef in the vicinity of that hole which had given an average gold value equivalent to 362 inch dwts. This haulage having been diverted in a southerly direction and having traversed the common boundary had reached a point approximately 10,300 feet from the Loraine shaft, a point from which it is

considered that a holing could economically be made from the Riebeeck No. 1 shaft. In order to obtain additional structural information, however, underground boreholes had been drilled from these haulages. A conglomerate zone had been intersected by one of these boreholes at a distance of approximately 1,150 feet from the common Loraine/Riebeeck boundary at an approximate depth of 4,550 feet from the surface which had assayed 12.93 dwts. a ton over a corrected width of 51.1 inches, equivalent to 661 inch dwts. A further borehole intersection, approximately 550 feet south of this borehole, had been announced on May 29, 1958, in which six reefs were revealed between approximate depths below the surface of 4,365 and 4,595 feet with values varying between 135 and 1,198 inch dwts. Other reef bands intersected in this hole had yielded negative values. According to the announcement these reefs are believed to lie stratigraphically above the payable reef intersected in the other boreholes.

The Chairman then stated that although much exploratory and development work had still to be carried out before the underground strata in the Riebeeck area could be fully determined, these disclosures in the northern portion of the Riebeeck Lease Area were very encouraging and must enhance the future prospects of the mine.

Capital expenditure, including preliminary expenses and the acquisition of mineral and surface rights amounting to £2,413,449, had been incurred by the Riebeeck Company up to March 31, 1958.

Reference was made to the recent publication in the press on June 23, 1958, regarding the arrangements for the merging of Riebeeck Gold Mining Company Limited with Loraine Gold Mines Limited, which are to be proposed shortly by the Boards of the two Companies for confirmation by the shareholders thereof.

A Stockholder in a letter had suggested that the administration expenses of the Company had been excessive and that the Company's surplus funds were employed at too low a rate of interest. In reply the Chairman stated that as the Company had to maintain an office not only in Johannesburg, but also in London to serve the interests of Stockholders, the Directors did not consider that in the present circumstances the amount expended was too high and that the company's funds had been placed at rates of interest which produced a maximum return allied with security of capital. The cash position should be maintained in view of its interest centred in the Riebeeck Company not only on account of its shareholding but also in the possible turning to account of the Lower Reefs in the van den Heeverrust area.

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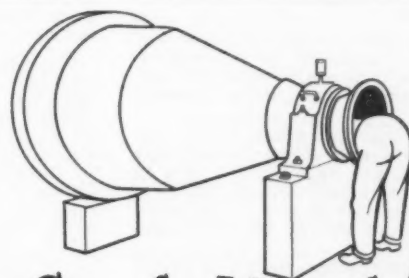
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STILFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

Mr. Jack Scott, the Chairman, presided at the 9th Annual General Meeting of Stilfontein Gold Mining Company Limited held at Johannesburg on June 12, 1958, and addressed the Meeting as follows:

The Reports of the Directors and the Consulting Engineers, together with the Accounts which you have before you, reflect satisfactory progress for the year 1957.

For some years I have referred to the onerous loan commitments of the Company, and it is a pleasure to be able to say that at long last the loan stock and short-term liabilities have been finally liquidated.

In their place we now have one loan of £800,000 secured by first mortgage on portion of the Company's European housing and repayable over a period of years.

The uranium and acid loans were reduced last year by £460,409 and at the year-end the outstanding balance was £3,833,790, which is being reduced in the normal way in terms of the loan agreements.

During 1957 the milling rate averaged 102,500 tons per month as compared with just on 90,000 tons for the previous year and the average yield per ton increased from 7.944 dwt. in 1956 to 9.173 dwt. The marked improvement in the recovery grade has in part resulted from the increase in the percentage of surface waste sorting from 24 per cent to 30 per cent.

Working costs rose by 2s. 1d. per ton, which is accounted for in the main by the increase in sorting, a higher Pneumoconiosis Levy, and an increase in power charges.

To cope with the increase in the milling rate, the rate of development was stepped up from 48,762 feet in 1956 to 61,011 for 1957, and although there was a slight drop in both gold and uranium values, the percentage payability was maintained.

There was a further increase of 75,000 tons in the ore reserves, which at the year-end totalled 4,361,000 tons with an average value of 9.94 dwt. per ton for gold and 0.321 lb. per ton for uranium over an estimated stoping width of 39.1 inches.

During the five months of this year 26,556 feet were developed, of which 7,360 feet were sampled, 85.9 per cent of which were payable at an average value of 398 inch dwt. for gold and 13.79 inch lbs. for uranium. The published monthly reports for the same period show an improvement in the tonnages milled, and in working profits.

The Income and Expenditure Account shows an increase in the overall net profit from £3,353,544 for 1956 to £4,700,966 for the year under review. Of this profit £1,159,965 was appropriated for capital expenditure in connection with gold production, the main items of which were the modification of the concrete headgear for the installation of a Koepe winder at the Margaret shaft, additional European housing, the purchase of the major portion of the freehold within the lease area and preparations for the deepening of the Margaret

shaft. On the uranium side, there was a small expenditure of £59,526 and £1,536,974 was used in the net redemption of the outstanding loans.

Capital expenditure for 1958 is expected to be in the vicinity of £3,000,000, the main items of which will be the sinking of the Margaret Shaft to its final depth, the installation of the Koepe winder, the completion of an extension of the gold reduction plant and a reef picking plant which should further improve the percentage of surface sorting of waste rock. Some expenditure will also be necessary on the preparation of the site for a new 20 ft. circular shaft, to be called the "Toni" shaft, which will be sunk to a depth of 4,500 ft. to provide access for men and materials to facilitate the exploitation of the eastern portion of the lease area. The shaft will be sited south-east of the Charles shaft across the main railway line.

It is the aim of the Company during the next four years to build up the milling rate to an eventual target of 150,000 tons per month. This expansion programme will of necessity involve considerable capital expenditure, mainly on two further extensions to the Reduction Plant, the installation of the Koepe Winder, the sinking of the Toni Shaft, and additional housing for the European and Native staffs.

In addition, I anticipate that some time during next year the Company will become liable for Income Tax, the first impact of which will, however, be cushioned to some extent by the redemption allowance related to this capital expenditure. Shareholders may rest assured, however, that in determining the capital expenditure programme, and in particular the phasing thereof, we have given due consideration not only to the question of taxation but also to the paramount importance of maintaining a satisfactory dividend rate.

In regard to uranium and acid, the working profit from this source for the year was £946,660, an increase of £185,374 over the figure for 1956. As you are no doubt aware, a limit of 6,200 tons per annum has been placed on the industry production to be purchased by the Combined Development Agency. The Stilfontein joint plant has been allotted a provisional allocation of 386 tons per annum, which is subject to confirmation by the Atomic Energy Board. This Company's share thereof is expected to be in the vicinity of 173 tons, which approximates closely to its present rate of production.

Last year I gave shareholders a detailed review of the Company's activities and interests in Stilfontein Township, in which its European employees are housed. As a result of the expansion of the mining activities of the three mining companies which it serves, the Township continues to grow, and this Company is taking its part in financing its development. In addition to the social and recreational amenities already provided, this Company is bearing a quarter of the cost of constructing and equipping a 18-hole golf course for the use of residents, and it will also assist in providing tarred roads and storm-water drainage in its own portion of the Township. The arrangements for the handing over to the Local Authority of the essential services have been completed, and a substantial refund of the depreciated cost of the electrical and sewerage services is expected some time during this year.

This concludes my review of the affairs of the Company.

SOUTHERN VAN RYN REEF GOLD MINING COMPANY

(Incorporated in the Union of South Africa)

Mr. Jack Scott, the Chairman, presided at the 42nd Annual General Meeting of Southern Van Ryn Reef Gold Mining Company Limited, held at Johannesburg on June 12, 1958, and addressed the Meeting as follows:

The Report and Accounts before you again reflect the satisfactory outcome of the policy to which your Company has adhered over the past seven or eight years. I refer to the maintenance and extension of your important interests in the Lucas Block area. These are now represented almost exclusively by your holdings in the Stilfontein, Hartbeestfontein, and Buffelsfontein mining companies, together with lesser but substantial holdings in New Pioneer and Eastern Rand Extensions. The investments in the Companies named represent more than 90 per cent of your Company's holdings of quoted shares.

Internal adjustments as between these holdings during the year resulted in share realization profits of £22,051, as reflected in the Accounts. This amount was re-invested together with certain additional funds, thereby increasing the book value of quoted investments by £73,647 to £556,033. As a result of the improved market level of all Lucas Block shares, the relative market valuation increased by £475,571 to a total of £1,673,206.

The remaining assets of the Company are reflected in the Accounts and do not call for comment, save for the remark that the Company continues to hold a 5½ per cent interest in the eastern portion of the Lucas Block not included in existing mining lease areas, and has accepted a minor participation in a prospecting programme which is being carried out under the control of the Anglo Transvaal Group on a block of farms lying immediately east of the Lucas Block.

My customary summarized statement of the affairs of your Company reflects the following position as at the 6th of this month.

QUOTED SECURITIES

| | |
|--|------------|
| Book Value ... | £556,633 |
| Market Value ... | £1,750,014 |
| Excess of Liabilities over Cash Assets ... | £38,965 |
| Sundry Assets ... | £2,727 |

Accepting the market value of quoted shares as their basis of valuation and taking all other assets at book value, the net equity may be valued at £1,713,776 as against the present Issued Capital of £410,000 in 4,100,000 shares of 2s. each.

On the subject of Income and Expenditure, you will have noted the expected and gratifying increase in dividend revenue, which has risen by £71,107 to a new high level of £104,647. The prospects of the Lucas Block mining companies leave some scope for further improvement in this figure. The increase of £5,439 in Administrative Expenses is due almost entirely to the increase in share transfer secretarial fees and expenses both in Johannesburg and London arising out of the maiden dividend. The Company has nearly 9,000 shareholders on its Register, and it will be appreciated that the payment of a dividend and the great increase in share transfer work re-

lated thereto has made this increased expenditure unavoidable. The net profit of the year improved from £64,794 to £110,044, making possible an increased dividend declaration, absorbing £85,417, and the transfer to General Reserve of £24,836.

In arriving at the net profit, provision was made for directors' fees totalling £4,245 as against £2,110 in the previous year. Your Company's Articles of Association contemplate that, with the approval of shareholders, the remuneration of the directors may be in some measure related to the results of their efforts, past as well as present, by the inclusion in their remuneration of an amount not exceeding 5 per cent of dividends declared. The amount included in this respect in the fees provided in the Accounts is calculated at 2½ per cent and your approval of such payment will be sought under the appropriate item in the agenda.

In past years it has been customary to include in this speech a brief summary of the progress made by the Stilfontein, Hartbeestfontein, and Buffelsfontein mining companies. It is felt, however, that the activities of these Companies are now so fully in the public eye and the information which they publish is so complete, that it is no longer necessary for me to comment on their affairs, apart from those points which I have already placed before you in dealing with the Accounts.

This concludes my review of the activities and present position of your Company.

EASTERN RAND EXTENSIONS LIMITED

(Incorporated in
the Union of South Africa)

Mr. Jack Scott, the Chairman, presided at the 24th Annual General Meeting of Eastern Rand Extensions Limited, held at Johannesburg on June 12, 1958, and addressed the Meeting as follows:

I am pleased to be able once again to report a substantial increase in the net revenue of the Company from £30,028 to £89,783. This is due almost exclusively to the constantly increasing dividend yield from its holdings in the Stilfontein, Hartbeestfontein, Buffelsfontein, and New Pioneer Companies. This trend may be expected to continue, though hardly at the same rate. On the expenditure side there has been an increase of £1,336 in Administrative costs, mainly as a result of increased activity in the share transfer department, both in Johannesburg and London. There has also been an increase of £1,805 in the provision for Directors' Fees, to which I shall refer later.

Of the profits available for appropriation £75,000 was absorbed by Dividend No. 2, as against £30,000 in the previous year, and an amount of £19,735 was added to General Reserve, bringing the total of that account to £200,000. An unappropriated balance of £22,484 was carried forward.

Before leaving the subject of Revenue, I am glad to be able to tell you that the dividend income of the Company for the current half-year has been up to expectations and the Board has in consequence been in a position to authorize payments of the interim dividend of 9d. per share of which you have no doubt read in the Press.

Dealing with the balance sheet, quoted

securities were increased by the further investment of £89,100 to a total book value of £543,638. Portion of the funds required was provided by the proceeds of redemption of 21,000 Dagbreekpers £1 preference shares at par and portion by short-term borrowings from the General Mining Corporation which are reflected in the balance sheet. These borrowings are being repaid during the present year. As against the book value of £543,638, the market value of quoted securities at the year-end was £1,527,457, an interesting comparison with the relative figure of £1,069,818 at the previous year-end.

There has been no change in the general character of your quoted investments, which consist as to more than 90 per cent of holdings in the Stilfontein, Hartbeestfontein, Buffelsfontein, and New Pioneer Companies. In past years it has been customary to comment in some detail on the progress and activities of these Companies, but they are now so firmly established as regular dividend payers, that I feel it unnecessary to add to the substantial volume of information already at your disposal through the regular publication of results by the Companies themselves.

The amount of approximately £44,000 appearing in the balance sheet under the heading Expenditure on Mineral Rights, etc., is still represented mainly by your 50 per cent interest in the mineral rights of Vermeulenskraal Noord 480 and Video 305 in the Orange Free State, adjacent to boundaries of the President Steyn and Harmony lease areas. The figure also includes a small amount expended during the year in respect of the minor participation which the Company has accepted in a prospecting programme which is being carried out under the technical control of the Anglo Transvaal Group on a block of farms adjoining the eastern boundary of the Lucas Block.

Arising out of an inquiry received from a shareholder, I regret that I am unable to report any improvement in regard to your shareholding in the Ellaton Gold Mining Company. As you have been told previously, the Ellaton mine was brought to production by the borrowing of amounts totalling over £2,500,000, the repayment of which must be provided for out of income before anything can accrue to shareholders. Working profits are in fact being earned at a rate exceeding £40,000 monthly, but technical assessments of the value of the mine make it clear that future income will in all probability be entirely committed to the repayment of the balance of the loans. In these circumstances we cannot revise our opinion of the shares which we wrote off entirely some years ago.

Other Assets which we continue to hold without change include certain urban property in Kroonstad, a 50 per cent indirect interest in 19 morgen of unimproved ground near the Elandsfontein traffic circle on the fringe of Boksburg, and a 5½ per cent interest in the portion of the original Lucas Block not included in existing mining lease areas.

In conclusion, I draw your attention to the provision in the accounts for the payment to directors of a fee calculated as a percentage of dividends distributed. The Articles make provision for the payment of such additional fee up to a limit of 5 per cent of the dividends. The amount recommended by the directors and provided for in the accounts is calculated at 2½ per cent. You will be asked to deal with this matter at a later stage in the agenda.

SIAMESE TIN SYNDICATE

MR. W. R. B. FOSTER'S STATEMENT

The fifty-first annual general meeting of Siamese Tin Syndicate, Ltd., was held on July 2 in London, **Mr. W. R. B. Foster**, chairman, presiding.

The following are extracts from his circulated review for the year 1957:—

The total cubic yardage worked is approximately the same, the somewhat lower production being due largely to the poorer ground worked at Peek and Huey Moot. This lower production has led to a corresponding increase in the cost per ton, and there was also a comparatively minor net average increase in the cost per cubic yard.

The balance of profit for the year is £363,000. We are unfortunately, however, currently faced with a severely depleted cash position due firstly to the operation of the International Tin Agreement which is affecting the earning power of the group very drastically; secondly to the large amount of about £470,000 required to finance the reconstruction of the Renong and Huey Moot dredges. We recommend the payment of a final dividend for 1957 of 3d. per stock unit making 1s. 1½d. per stock unit for the full year. We have reluctantly come to the conclusion that we cannot declare a first interim dividend for 1958.

I am glad to report that those of our companies which are controlled from the United Kingdom have been provisionally declared to be O.T.C.'s for the tax year 1957-58 and should accordingly pay no U.K. income tax on their overseas profits for 1956.

Our prospecting in Thailand and Malaya has this year enabled us to add about 22 million cu. yds. to our existing reserves, made up as to 8 million cu. yds. at Huey Moot, 1 million each at Bangnon and Katu, and 12 million cu. yds. at Bangrin.

International Tin Agreement

Stockholders will have seen from the press that the clauses in this Agreement relating to the control of exports by the producing countries were invoked by the Tin Council in December, 1957. The Council at that time imposed and has since maintained very severe restriction on exports of tin from all member producing countries. As each producing country's permitted exports were based upon an average of three years' "free" production, Thailand with her rising output in fact received less than her due share on the basis of current world figures. The situation is that our permitted export of concentrates for 1958 will be about 35% of our 1957 production. This is a most unpleasant position in which to find ourselves, but let us hope that the severe measures imposed to balance world production with consumption are only temporary.

In considering the world tin situation today, we have to face the unfortunate fact that a number of countries, important as consumers or producers, still do not participate in the International Tin Agreement.

Bearing in mind the constant upward pressure on our costs, I see no escape from reduced profits during the next few years. However, we are taking every step open to us to modernize and make efficient our equipment.

The report and accounts were adopted.

SELECTION TRUST

Mining Exploration and Finance

RESULTS FOR YEAR ENDED 31st MARCH, 1958

| | £ | (1957) £ |
|---|------------|-------------|
| Revenue, less expenses, of the Company and its Subsidiaries was | 3,133,192 | 4,566,691 |
| Taxation amounted to | 1,626,962 | 2,344,813 |
| leaving | £1,506,230 | £2,221,878 |
| which has been applied as follows :— | £ | £ |
| Transfers to Reserves and increase in Unappropriated Profits | 435,523 | 1,200,924 |
| Preference Dividends, net | 25,875 | 25,875 |
| Ordinary Dividends (7s. per stock unit), net | 1,044,832 | 995,079 |
| | £1,506,230 | £2,221,878 |

Exploration Reserve was charged with Exploration Expenditure amounting to £208,518 (1957—£133,279) and Investment Reserve was charged with Depreciation on Investments amounting to £53,439 (1957—Cr. £6,047).

CONSOLIDATED FINANCIAL POSITION

| | £ | £ |
|--|------------|------------|
| Capital and Reserves | | |
| Issued Capital, 5,191,711 stock units of 10s. .. | 2,595,856 | 2,472,243 |
| Reserves and Unappropriated Profits | 4,045,390 | 4,003,036 |
| Outside Interests in Subsidiaries | 1,217,690 | 1,236,350 |
| Debenture Stock outstanding | 133,474 | 139,054 |
| | £7,992,410 | £7,850,683 |
| Assets | | |
| Quoted Investments at book value | 4,222,464 | 3,632,483 |
| Unquoted Investments at book value | 1,407,817 | 649,284 |
| Payment for Securities since issued | — | 937,423 |
| Net Current Assets | 2,233,966 | 2,444,917 |
| Freehold Property and other assets | 128,163 | 186,576 |
| | £7,992,410 | £7,850,683 |

The quoted investments appearing at £4,222,464 had a market value on the basis of Stock Exchange prices at 31st March, 1958, of £19,344,908.

The unquoted investments appearing at £1,407,817 included the holding in Tsumeb Corporation, which stands in the books at £35,639, but which, valued on an arbitrary basis, is worth about £4,000,000.

INVESTMENTS

Selection Trust and its Subsidiaries are principally interested, directly and indirectly, in the following companies :—

American Metal Climax
Bikita Minerals
Chibuluma Mines
Consolidated African Selection Trust
Mufulira Copper Mines
Rhodesian Selection Trust
Roan Antelope Copper Mines
Sierra Leone Selection Trust
Trepca Mines
Tsumeb Corporation
Vaal Reefs Exploration and Mining Company
Western Deccala Petroleum
Western Holdings

EXPLORATION

The principal exploration activities are centred in Canada and Africa and conducted mainly by two Subsidiaries :—

Selco Exploration Co. Ltd.,
Suite 600,
77, York St., Toronto.

African Selection Trust (Pty.) Ltd.,
733, "Libertas",
62, Marshall St., Johannesburg.

Copies of the Annual Report for the year ended 31st March, 1958, may be obtained at the Company's Transfer Office at
26 & 27, WHITE STREET, MOORFIELDS, LONDON, E.C.2.

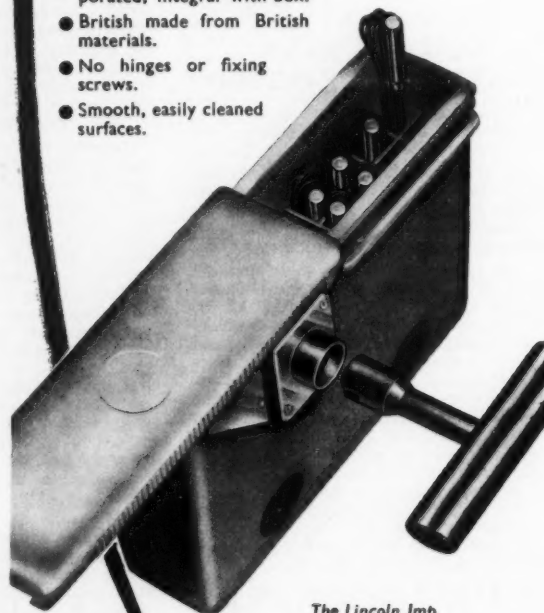
The Annual General Meeting of Selection Trust Limited will be held at 12 noon on 24th July, 1958, at
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